

PATENT APPLICATION TRANSMITTAL LETTER
(Small Entity)

Docket No.
SPUR102

TO THE ASSISTANT COMMISSIONER FOR PATENTS

Transmitted herewith for filing under 35 U.S.C. 111 and 37 C.F.R. 1.53 is the patent application of:

Dennis W. Hicks et al.

For:

NETWORK DOCUMENT DELIVERY SYSTEM

Enclosed are:

- ☒ Certificate of Mailing with Express Mail Mailing Label No. EL003481995US
- ☒ Sixty-Six (66) sheets of drawings.
- ☐ A certified copy of a _____ application.
- ☒ Declaration ☒ Signed. ☐ Unsigned.
- ☒ Power of Attorney
- ☐ Information Disclosure Statement
- ☐ Preliminary Amendment
- ☒ Six forms _____ Verified Statement(s) to Establish Small Entity Status Under 37 C.F.R. 1.9 and 1.27.
- ☒ Other: **Recordation Cover Sheet 7 Assignment Documents; Election of Assignee; Microfiche Appendix**

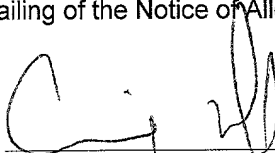
CLAIMS AS FILED

For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	288	- 20 =	268	x \$11.00	\$2,948.00
Indep. Claims	2	- 3 =	0	x \$41.00	\$0.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
BASIC FEE					\$395.00
TOTAL FILING FEE					\$3,343.00

- ☒ A check in the amount of \$3,383.00 to cover the filing fee is enclosed.
- ☐ The Commissioner is hereby authorized to charge and credit Deposit Account No. _____ as described below. A duplicate copy of this sheet is enclosed.
- ☐ Charge the amount of _____ as filing fee.
- ☐ Credit any overpayment.
- ☐ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
- ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

Dated:

10/20/98



Signature

Craig M. Korfanta (33,255)
P. O. Box 1840
Boise, ID 83701-1840

(208) 336-1234

cc:

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f) AND 1.27 (c)) - SMALL BUSINESS CONCERN**

Docket No.
SPUR102

Serial No.

Filing Date

Patent No.

Issue Date

Applicant/ **Dennis W. Hicks, Richard Newman, Gary Johnson, Lisa O'Toole, David Hay, Chris Gyllenskog, Steven C.**
Patentee: **Johnson, Matt Stephenson, Frank Hartmann, Ray Asbury and Eric Luttmann**

Invention:

NETWORK DOCUMENT DELIVERY SYSTEM

I hereby declare that I am:

- ☐ the owner of the small business concern identified below:
☒ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN: **SPUR PRODUCTS**ADDRESS OF CONCERN: **9288 W. Emerald Street, Boise, ID 83704**

I hereby declare that the above-identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the above identified invention described in:

- ☒ the specification filed herewith with title as listed above.
☐ the application identified above.
☐ the patent identified above.

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed on the next page and no rights to the invention are held by any person, other than the inventor, who could not qualify as an independent inventor under 37 CFR 1.9(c) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☒ no such person, concern or organization exists.
☐ each such person, concern or organization is listed below.

FULL NAME

ADDRESS

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

FULL NAME

ADDRESS

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

FULL NAME

ADDRESS

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

FULL NAME

ADDRESS

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING:

Dennis W. Hicks

TITLE OF PERSON SIGNING

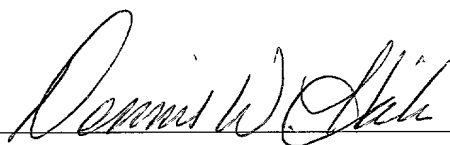
OTHER THAN OWNER:

President and CEO

ADDRESS OF PERSON SIGNING:

SPUR PRODUCTS**9288 W. Emerald Street****Boise, ID 83704**

SIGNATURE:



DATE:

Oct 2, 1998

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f) AND 1.27 (b)) - INDEPENDENT INVENTOR**

Docket No.
SPUR102

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Issue Date

Applicant/ **Dennis W. Hicks, Richard Newman, Gary Johnson, Lisa O'Toole, David Hay, Chris Gyllenskog,**
Patentee: **Steven C. Johnson, Matt Stephenson, Frank Hartmann, Ray Asbury, and Eric Luttmann**

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- ☒ the specification to be filed herewith.
☐ the application identified above.
☐ the patent identified above.

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

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☒ Each such person, concern or organization is listed below.

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FULL NAME

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF INVENTOR Dennis W. Hicks

SIGNATURE OF INVENTOR 

DATE:

10/2/98

NAME OF INVENTOR Richard Newman

SIGNATURE OF INVENTOR 

DATE:

10/1/98

NAME OF INVENTOR Gary Johnson

SIGNATURE OF INVENTOR 

DATE:

10/1/98

NAME OF INVENTOR Lisa O'Toole

SIGNATURE OF INVENTOR 

DATE:

10/1/98

NAME OF INVENTOR David Hay

SIGNATURE OF INVENTOR 

DATE:

10/1/98

NAME OF INVENTOR Chris Gyllenskog

SIGNATURE OF INVENTOR 

DATE:

10/1/98

NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

DATE:

NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

DATE:

NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

DATE:

NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

DATE:

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f) AND 1.27 (b)) - INDEPENDENT INVENTOR**

Docket No.
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Applicant/ **Dennis W. Hicks, Richard Newman, Gary Johnson, Lisa O'Toole, David Hay, Chris Gyllenskog,**
Patentee: **Steven C. Johnson, Matt Stephenson, Frank Hartmann, Ray Asbury, and Eric Luttmann**

Invention:

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☐ the application identified above.
☐ the patent identified above.

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

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☒ Each such person, concern or organization is listed below.

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FULL NAME **SPUR PRODUCTS**

ADDRESS **9288 W. Emerald Street, Boise, ID 83704**
☐ Individual

☒ Small Business Concern

☐ Nonprofit Organization

FULL NAME _____

ADDRESS _____

☐ Individual

☐ Small Business Concern

☐ Nonprofit Organization

FULL NAME _____

ADDRESS _____

☐ Individual

☐ Small Business Concern

☐ Nonprofit Organization

FULL NAME _____

ADDRESS _____

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☐ Small Business Concern

☐ Nonprofit Organization

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF INVENTOR Steven C. Johnson

SIGNATURE OF INVENTOR 

DATE: 10/2/98

NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

DATE: _____

NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

DATE: _____

NAME OF INVENTOR _____

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SIGNATURE OF INVENTOR _____

DATE: _____

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f) AND 1.27 (b)) - INDEPENDENT INVENTOR**

Docket No.
SPUR102

Serial No.

Filing Date

Patent No.

Issue Date

Applicant/ **Dennis W. Hicks, Richard Newman, Gary Johnson, Lisa O'Toole, David Hay, Chris Gyllenskog,**
Patentee: **Steven C. Johnson, Matt Stephenson, Frank Hartmann, Ray Asbury, and Eric Luttmann**

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☐ the patent identified above.

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NAME OF INVENTOR Matt Stephenson

SIGNATURE OF INVENTOR Matt SS

DATE: 10-2-98

NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

DATE: _____

NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

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DATE: _____

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f) AND 1.27 (b)) - INDEPENDENT INVENTOR**

Docket No.
SPUR102

Serial No.

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Patent No.

Issue Date

Applicant/ **Dennis W. Hicks, Richard Newman, Gary Johnson, Lisa O'Toole, David Hay, Chris Gyllenskog,**
Patentee: **Steven C. Johnson, Matt Stephenson, Frank Hartmann, Ray Asbury, and Eric Luttmann**

Invention:

NETWORK DOCUMENT DELIVERY SYSTEM

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NAME OF INVENTOR Frank Hartmann

SIGNATURE OF INVENTOR Frank G. Hartmann

DATE: Oct. 1, 1998

NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

DATE: _____

NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

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NAME OF INVENTOR Ray Asbury

SIGNATURE OF INVENTOR 

DATE: 10/2/98

NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

DATE: _____

NAME OF INVENTOR _____

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NAME OF INVENTOR Eric Luttmann

SIGNATURE OF INVENTOR *Eric J. Luttmann*

DATE: 10/2/98

NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

DATE: _____

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DATE: _____

NAME OF INVENTOR _____

SIGNATURE OF INVENTOR _____

DATE: _____

"Express Mail" mailing label number EL 003481995 US

Date of Deposit OCTOBER 20, 1998

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" services under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Typed Name of Person Mailing Paper or Fee: MAGGIE DEEDS

Signature: Maggie Deeds

UTILITY PATENT APPLICATION

NETWORK DOCUMENT DELIVERY SYSTEM

INVENTORS:

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RECEIVED OCT 20 1998

5 TITLE OF INVENTION: Network Document Delivery System

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Microfiche Appendix: This specification has appended hereto a microfiche appendix having 17 fiche containing approximately 4600 frames.

RELATED APPLICATIONS: This application claims the priority of Provisional Application Serial No. 60/063,891 filed October 22, 1997.

DESCRIPTION

BACKGROUND OF THE INVENTION

Technical Field. This invention generally relates to document handling on a computer network, and more particularly, this invention relates to a recipient based system for printing, faxing, storing and transmitting electronic documents across networks.

Background. Modern business requires that computing environments become more flexible, easy to use, allow for growth, and in particular, be measurably cost effective. A fundamental element of computing environments is the handling of documents. The concept of a "document" is now much more than just a printed piece of paper. A document can be printed in both black and white and color, it can be viewed electronically, it can be archived on removable or fixed storage media, and it can be transmitted electronically. Unfortunately, the traditional mechanisms for delivering documents consist of independent solutions. This problem is characteristic of the current device based paradigm for document delivery. It would therefor be desirable to provide a single integrated solution which allows a network

5 user to deliver his or her document to one or more different destinations or recipients in a single step regardless of the end form in which the document is presented.

SUMMARY OF THE INVENTION

10 According to the present invention, this general end is achieved by a system of networked computers, peripherals and document delivery software which provides the user with a familiar simple user interface, such as a print dialog box in a Windows® environment, to deliver documents to a variety of different destinations, both within the network, across networks and outside of the network via remote links.

15 In one embodiment of the invention, a document generation device participating in the system, whether directly connected to the network or interacting full or part time through a remote link, may be provided with a print driver which translates an electronic document into a non-specific, or printer independent, printer language file and appends to this file a job ticket containing any other rendering characteristics which may not be supported by the printer independent language.
20 Rendering characteristics include such things as color or monochrome output, duplex printing, number of original copies, stapling, collating, binding, recipient and destination information, etc. This entire file is then transmitted to the system server which analyzes the file, including the rendering characteristics; determines the best output device(s); appends output device specific commands to the general printer
25 language file; and transmits this file to the device(s).

The job ticket and related flexibility of the software also enable recipient based delivery and result based delivery, both of which represent a paradigm shift away from device based printing. Recipient based delivery focuses upon the location of a particular recipient and the medium through which that recipient prefers
30 to receive information, as opposed to a particular printer in the general location of the recipient. Result based delivery focuses on the presentation and medium for delivery of information, as opposed to a particular device or device location.

In one embodiment of the invention, the software on the server assigns an affinity value to each print job based upon the job size, destination and
35 rendering characteristics. This affinity value is then used to determine which output

5 device(s) will receive the document. The server must therefor be aware of what
output devices are participating in the system, where they are located, what their
specific characteristics are and whether or not any particular device is currently
available. This information may be gathered automatically by having the server poll
for network resources, the information may be manually entered by a user or system
10 administrator, or the information may be input by a combination of the two methods.
The user may elect to bypass the invention by selecting a specific printer driver
rather than that of the invention. In this case, the invention software on the server
simply forwards the print job on to the specific printer requested.

15 This system facilitates the ability to implement many other valuable
and desirable features. One such feature is the ability to distribute a large job over
two or more output devices participating in the system, essentially defining multiple
output devices as a single output device. This is most advantageous where a single
job contains multiple original copies and each output device receives one or more
entire copies to output, thereby decreasing output time by a factor of the number of
20 output devices and not causing the user to collate pages from multiple output
devices. Additionally, the invention can distribute jobs over the output resources on
the network to even distribute the workload.

25 Another feature which may be implemented is an activity log or journal
which can provide detailed information concerning usage. The log can provide such
information as the size and number of print jobs requested by any combination of
users for billing purposes; job completion verification; diagnostic information to allow
an operator to determine when and why jobs failed; and resource utilization
information such as toner usage for a printer to plan for inventory, expenses and
maintenance. The journal may be kept in a standard database format which may be
30 easily imported to accounting, database or other computer applications.

The invention can support virtually any output device such as:
standard image forming devices including printers, plotters, and video; facsimile
devices; email communications; data communications links; and archival devices. In
the case of hard copy image forming devices such as a laser printer, both banner
35 and receipt pages can be generated. Banner pages can be used to identify sets of

5 jobs on each printer and notify the operator of any finishing operations to be performed. Receipt pages can be used to provide a short job summary and verify job completion. Supported data communications can include serial telecommunications via data modems, network communications using TCP/IP, NetBEUI, IPX/SPX and ETHERTALK. Supported storage devices for archival
10 purposes as well as job submission, include floppy diskettes, IOMEGA JAZ drives and SYQUEST SYJET drives.

Advantageously, archival and storage of documents may be done in a platform independent format such as ADOBE's Portable Document Format (PDF). PDF allows a user of virtually any operating system to view and print archived
15 documents using a freely distributed viewing program, ADOBE ACROBAT READER.

In another embodiment of the invention, the software on the server can be configured so that a job sent to a specific port or by a particular type of printer driver is always output the same way or according to a specific set of rules. This enables document generation devices to use a standard printer specific printer
20 driver, such as a HEWLETT PACKARD LASERJET driver, and still have the job output to one or more different devices.

Additional advantages and novel features of the invention will be set forth in part in the description that follows, in the attached appendix and in part will become apparent to those skilled in the art upon examination of the following or may
25 be learned by practice of the invention. The objects and advantages of the invention may be realized and attained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

30 Fig. 1 is a schematic representation of a network document delivery system according to the invention;

Fig. 2 is a block diagram illustrating the functional aspects of the software;

Fig. 3 is a graphic representation of the connections that may be made
35 to a representative hardware system;

5 Fig. 4 is a graphic representation of a high level system object model of the invention;

Fig. 5 is a graphic representation of a subordinate level object model showing the relationship between a task and a job;

10 Fig. 6 is a graphic representation of a subordinate level object model showing the relationship between users and objects;

Fig. 7 is a graphic representation of a subordinate level object model showing the relationship between the general product and different types of output;

Fig 8 is a graphic representation of a subordinate level object model showing the relationship between a data source and the data port;

15 Fig. 9 is a graphic representation of a subordinate level object model showing the relationship between a general device, a pool of devices, an atomic device, a remote system, a system device and an array of devices;

Fig. 10 is a graphic representation of a subordinate level object model showing the hierarchical relationship between a system device and an atomic device;

20 Figs. 11 and 12 describe the general life cycle model and rely on the schemata of Figs. 13 through 55;

Fig. 56 describes the Fusion notation used in Figs. 4 through 10;

Fig. 57 describes the Life Cycle Model notation used in Figs. 11 and 12;

25 Figs. 58 through 61 describe various notation schemes used in Figs. 62 through 66;

Fig. 62 is an object interaction graph illustrating how affinity is determined;

30 Fig. 63 is an object interaction graph illustrating the submit job sequence;

Fig. 64 is an object interaction graph illustrating the instruct to job ticket sequence;

Fig. 65 is an object interaction graph illustrating the instruct to instruction set sequence;

5 Fig. 66 is an object interaction graph illustrating the normal execute sequence; and

Figs. 67 through 81 illustrate one possible graphical user interface for the job ticket and show some of the various delivery options.

10 DETAILED DESCRIPTION OF THE INVENTION

Referring now to the figures, one possible network document delivery system, generally designated at 10 in the figures, according to the invention will be described in detail. The network shown includes at least one document generator 11, such as a networked personal computer, having a client user interface 12 installed therein; a server 13 having main job processing software 14 therein including a server user interface 15; and two or more document output devices 16. Fig. 3 shows a representative hardware connection configuration or network on which the invention may be implemented.

The simplified user model illustrated in Fig. 2 provides a procedural view of system operation. In this model, the overall system may include a main program 14, multiple data sources, such as client print driver 17, and/or other input clients, such as a manufacturer specific print driver 18, and multiple output devices 16.

A job is sent from a data source such as document generator 11 to main program 14 via a data port 19. A job must contain a data stream to be rendered, also referred to as image data, on some output device. The job may also contain a job ticket, which is a collection of specific information concerning the desired output presentation, such as a standard hard copy print job; a fax; an archival; an email; finishing features; routing information; and even billing information.

In the case, where print driver 17 is used, here when the user selects "auto" as the print destination, job ticket information is provided by client print driver 17. In this case print driver 17 includes a generic language translator 24 which translates an electronic document into a non-specific, or printer independent, printer language file and appends to this file a job ticket containing any other rendering

5 characteristics which may not be supported by the printer independent language. In other cases, the job information may be provided by 'default' job tickets or port profiles associated with a data port, a user name which can be determined from the network name, or a system default job ticket.

10 Job parser 20 examines the incoming job for a job ticket and applies default job tickets as required, then sends the job to routing and affinity process 21. Routing and affinity process 21 determines the capabilities required to complete the job successfully and the affinity of each potential output device for the job. Routing and affinity process 21 assigns an affinity value to each print job based upon the job size, destination and rendering characteristics by comparing the requested features
15 with the available features logged in resource library 25. Available resources may be gathered and logged into resource library 25 by server 13 automatically by polling the network for resources. Additionally, the information may be manually entered by a user or system administrator or it may be input by a combination of the two methods. The job is then routed to a device specific assembler 22, also sometimes
20 called the 'transform', to change the image data to a device specific form. The image data is then sent to the appropriate output device(s) 16 via a communications channel 23. In addition, the current status of each device can be monitored by the main program via communication channel 23.

25 Most commonly, output devices 16 are printers, but they can also be fax machines, electronic storage media, such as a 'file' on diskette, removable media, hard disk, tape drive, network drive, etc., or even email.

The simplified model can be extended to include multiple data ports with an associated default job ticket or port profile for each. A combination of port and port profile is referred to as a 'virtual queue'. Also, note that client print driver 17
30 can reside on the same host as main program 14, so that the operator of main program 14 can also submit jobs.

While the simplified user model illustrated in Fig. 2 provides a procedural view of system operation, the following illustrative embodiment takes advantage of the multitasking nature of a host operating system, such as WINDOWS

5 NT and the capabilities of object oriented programming techniques. This embodiment is illustrated in Fig. 4.

Here, the main program is actually a set of programs running simultaneously. Also, the job parsing, routing, and assembling functions are spread out over a set of objects. One possible set of object models are shown in Figs. 4 - 10. An explanation of the notation is included in Figs. 56 - 61, but in general, diamonds show relationships between models, and triangles denote hierarchy. For instance, referring to Fig. 5, a job is a task, and a job includes at least one document. Tasks may have one or more parent/child relationships. External agents, such as the human operator, are also represented by objects, even though the object may not have a corresponding software implementation.

Each of the objects shown in Fig. 4 can be decomposed or broken down into other objects as shown in the other figures. The objects enclosed within dashed lines are programs. The Operator, Recipient, and User are people as shown in Fig. 6. A Product is the output of the system as shown Fig. 7.

A job is created by a data source such as a document generator 11 and more specifically, usually by client print driver 17. Fig. 8 shows a more detailed view of possible types of data sources and their relationships to data ports. Note that remote systems can send jobs just like any local source. Likewise, a remote system may be configured as a device. This allows passing of a job from system to system, in a distributed network-like manner. The purpose for configuring the systems this way is to reduce phone charges by using local area network (LAN) communications between main systems. This allows jobs to be passed to LAN or phone connected printers, even though the printers are not available to the local system.

The data source passes the job to the data port. Note that everything inside the area surrounded by the dotted line, including the data port, are the main programs. The job parsing function is performed by the data port. The port creates a job object in the system that includes a document, i.e. image data, and job ticket as shown in Fig. 5. The job ticket may need to be formed from an associated port and/or user profile, i.e. a default job ticket. The job ticket is designed to allow routing

5 of the job to the best device and storing of data for billing and management purposes. The job ticket allows separation of the job specific features, such as number of copies, finishing, recipient information, etc., from the image data. Eventually job specific information needs to be in a form unique to each printer or output device, depending on its manufacturer and its configuration as it was
10 installed, as some finishing features such as sorters and staplers are optional. The specialization of the generic or device independent data stream to the actual production device data stream is done after the production device is chosen by the system.

The data port creates a job and passes it to the system device. Fig. 9
15 shows the device hierarchy, and Fig. 10 shows the device relationships. There is only one system device in the system, and it is always the first device to receive each job. Every device examines the job to see if it can produce it, decompose it into tasks, or route it to a child device. Thus, the devices contain the routing function shown in the simplified model. All devices are implemented as objects. Device
20 objects are serialized meaning configuration parameters are stored to disk so that they may be restored after a system reset.

A key feature of the device design is the relationship between pools, arrays, and atomic devices as illustrated in Fig. 10. A pool is generally a grouping of like devices. The grouping can be by function such as faxes, printers, or archive
25 devices, or by some other criteria such as location, e.g. all printers on the second floor, permissions, or routing. An array is a collection of like devices. An atomic device represents the smallest whole constituent part. As far as the parent pool is concerned, an array is an atomic device, and thus the array class is derived from the atomic device class. At the lowest level, an atomic device 'knows' that it is capable
30 of producing a product, and thus will determine its capabilities and will calculate an affinity for a given job. All devices are ultimately derived from a single device class. This design pushes specialization to the lowest possible level. If a device needs a particular resource to produce a product, fonts or electronic forms for example, it submits a request to the resource library.

5 Devices contain many of the unique features of the invention. As an example, arrays are defined as collections of devices which are capable of receiving and producing the desired output. The device hierarchy and built in routing capability allow arrays to break a job down into tasks, one task per copy. The separate tasks are sent to each of the devices constituting the array as each device is ready to
10 receive it. Another example of a unique feature is the intelligent routing accomplished through capabilities and affinities. The logic for routing is built in to each atomic device. The pass/fail response on capabilities and affinity number for a task is passed to the parent device, which then compares the responses from each child device and sends the task to the appropriate device.

15 Another unique feature of the invention is intelligent translation of a job defined for one type of output device into another. Incoming jobs are often in a data stream that is incompatible with the best fit output device. The intelligent translation device performs the appropriate translation based upon a separate determination of the best fit output device. A current embodiment is capable of translating from
20 POSTSCRIPT to various forms of HP-PCL and PDF.

25 Other unique features can include color separation where pages with color data are separated from a predominately black and white data stream and sent to a color printer. Most of the document will be printed on a black and white printer which generally has a lower cost per page than color printers. This feature can be implemented by configuring the client print driver to put page boundary markers in the source document data stream.

30 The resource library and activity log or journal are advantageously coded as separate systems running simultaneously with the main system. The activity journal may be a database containing various tables, entries, queries, and reports relevant to the system. The database interface can be provided by the operating system. The database and its schema, e.g. tables, queries, etc., are created at system startup if they don't already exist. Exemplary database tables might include: an ActionLog which contains system startup and configuration change information; a Billing log which contains originator billing information; a Company log
35 which contains company address information; a FaxList log which relates fax

5 completion statistics to recipients; a Job log which contains job information, such as
start time, stop time, originator, etc.; an Originator log which contains originator
information such as address, phone number, etc.; a Recipient log which contains
recipient address information; a Recipient list which relates jobs to recipients; a Task
log which contains task information such as start time, stop time, production device,
10 etc., and a device log which contains physical device information.

The operator user interface allows the operator to configure the main
system for the needs of a particular installation, and is implemented as a separate
program from the main system. The main system is capable of operating without the
operator user interface running. The operator user interface also saves and loads
15 job templates. Job templates are job tickets that have been saved for later use, and
can be edited before submitting a job.

When the user selects "Auto" instead of a specific printer in the
graphical user interface, the invention examines the job ticket information to route
print jobs to the most effective printer. This feature may be disabled during
20 configuration. If a specific printer is selected by the user, and the printer does not
exist, then the job remains unassignable.

Each job is routed to a printer depending on whether the job can be
printed at all, printer capabilities, and the best fit of additional performance or post-
processing factors, i.e. the affinity of the job to a printer or printer to a job.

25 Devices have a subset of attributes that define the types of tasks that
can be processed. If a task requests a function that is outside the set defined by the
device's attributes, then the device is considered to be incapable of processing the
task. The attributes include the range of number of pages allowed in a single task,
the ability to print color or strictly back and white pages, the ability to print duplex,
30 and the ability to support a requested paper size, color or weight. A task's
requirements must fall within all of these restrictions. A task for which no capable
devices can be found is considered "Unassignable".

In addition to the above attributes each device is given a unique name,
and also has an indicator that specifies if the device should be a candidate during
35 "Automatic Assignment". Automatic Assignment is device selection that is

5 insensitive to the device's name. If Automatic Assignment is not allowed by a
device, and the task does not request that device specifying its name specifically,
then the device is considered incapable. If a task requests a specific device, all
devices that do not have the name requested are also considered incapable. If no
device by the requested name is present in the system, or if no direct path to the
10 requested device is present, then the task is changed to allow Automatic Assignment
without regard for originally requested device name. If no device name is ever
requested by the task, Automatic Assignment is assumed.

Devices have another subset of attributes that define the device's
ability to automate a number of processing options which include the device's
15 processing performance, and the operator's preference toward device. The affinity
value for a device is calculated by accumulating the individual affinities given by
examining each of the individual attributes.

The automation attributes include the device's ability to collate, to
staple, to fold, to drill, to bind, and to add covers. If a task requests one of these
20 functions, the devices that provide the function are given a higher affinity than those
devices that do not provide the function. Additional automation functions supported
by the device, that are not requested by the task, are simply ignored.

The device's performance is given as a single Impressions Per Minute
(IPM) value. The assumption is made that one minute is the optimal average
25 amount of time that a device should spend processing a single task, and that thirty
seconds is the standard deviation. A standard bell curve is used to assign relative
affinities to each device for a given task.

The operators preference is given as a single value from one to ten. A
higher value gives a higher affinity. Each of the above factors is weighted so that a
30 priority relationship between them can be enforced. A higher priority factor will take
precedence over any single factor with a lower priority, and the sum of all factors
with lower priorities. The priority standings are as follows: 1) Collation; 2) Stapling;
3) Folding; 4) Stitching, Drilling, Binding, and Cover Insertion; 5) Operator
Preference; 6) Cost; and 7) Performance

5 Array Pools and the devices under them have special routing issues.
 The capability and affinity rules described above must be adjusted to account for
 these issues. An array is capable of processing a task if any of the devices under it
 are capable of processing the task. There are two adjustments to the standard
 capability testing performed by the devices under the array. The allowable number
 10 of pages and the requested device name are tested at the array level, not at the
 subordinate device level. The page range is not used because it is not always
 known ahead of time how many pages each device in the array will print. The device
 name testing would allow a maximum of only one device to be capable of defeating
 the purpose of the array.

15 The affinity of an array can be determined by averaging all of the
 affinities of the capable and available subordinate devices. There is only one
 adjustment to the standard affinity calculations performed by the sub-devices. The
 device's performance is not factored into the result because, again, the page count
 for each device is not known. All other affinity factors are evaluated normally.

20 Figs. 11 through 55 describe a life cycle model of one embodiment of
 the invention. The life cycle model describes the order in which system operations
 may occur. The life cycle model, together with the system operation schemata
 shown specifically in Figs. 13 through 55, fully describe the behavior of the system.

25 The following rules apply to interpreting the life cycle model and
 schemata:

Alphabet. Any input or output event may be used in an expression. Output
 events are prefixed with #.

Operators. Let x and y be life-cycle expression, then:

- 30 x.y denotes x is followed by y.
- x|y denotes either x or y occurs.
- x* denotes zero or more occurrences of x
- x~ denotes zero or more occurrences of x simultaneously
- [x] denotes that x is optional.
- 35 x||y means arbitrarily interleaving the elements of x and y.

Substitutions. An expression can be named in a substitution:

Name = Life-Cycle Expression

10 Name may be used in other expressions, but substitutions must not be recursive.

Operator precedence. In decreasing order the precedence is:

[], *, +, ., |, ||

15 Expressions may be bracketed to override default precedence.

The Operation models in the Life Cycle Model are done through textual schemata. Each schema within the schemata shown in Figs. 13 through 55 lists seven sections: (1) Operation - the name of the system operation being described; (2) Description - a free-form abstract of the intent of the operation; (3) Reads - a list of values that are accessed but not changed by the operation; (4) Changes - a list of values that may be modified by the operation; (5) Sends - output events sent by the operation to objects outside the systems (these objects are known as agents); (6) Assumes - a list of conditions that are assumed as being true when the operation begins (if the conditions are not true and the operation is invoked, then the operation's actions and results are undefined); and (7) Result - the conditions and changes in state that are true when the operation has completed.

The recipient and result based paradigms mentioned earlier can be better understood making reference to Figs. 67 - 81. In the recipient based paradigm, a user simply selects the recipient from the recipient list as is shown in Fig. 67. The information is then delivered to that recipient based upon the recipient's preferred device or devices. New recipients can be defined by entering the new recipient's information, such as that shown in Figs. 68 - 70, or possibly as a result of that particular recipient joining the system as a new user by entering new user information, such as that shown in Figs. 71 - 73. Printing and delivery options can

5 be selected by entering in the desired characteristics on the job ticket such as those shown in Figs. 74 - 81.

The result oriented delivery paradigm is more of an inherent result of the design of the invention and is directly related to the affinity feature and a device's capability to produce the requested output. Prior to this invention, output
10 characteristics beyond the capability of a particular output device either simply were not presented as available options to the user or were altered, usually by being eliminated altogether, by the device specific print driver as the job was output. With the flexibility of this invention and ability to alter the affinity weighting, all or some of the paradigms can be implemented to whatever degree is desired.

15 While there is shown and described certain embodiments of the invention, it is to be distinctly understood that this invention is not limited thereto but may be variously embodied to practice within the scope of the following claims.

We claim:

1 1. A system for delivering documents across a network which
2 comprises:
3 a document generator configured to output a data stream in a device
4 independent format;
5 a computer configured to receive the device independent format data
6 stream and programmed to analyze the data stream to determine a best output
7 device by comparing any features required by the data stream with features of any
8 output devices available to the computer; and
9 the computer further being programmed to translate the device
10 independent data stream into a device specific data stream for the best output
11 device and to transmit the device specific data stream to the best output device.

1 2. The system of claim 1 wherein the document generator is
2 further configured to embed data into the data stream indicative of a job ticket
3 containing information including rendering characteristics for a generated document
4 and at least one task.

1 3. The system of claim 2 wherein the computer is further
2 programmed to determine a best output device based upon an affinity value for each
3 output device and whether a particular output device is capable of producing what
4 the data stream requires.

1 4. The system of claim 1 wherein the computer is further
2 programmed to determine a best output device based upon an affinity value for each
3 output device and whether a particular output device is capable of producing what
4 the data stream requires.

1 5. The system of claim 4 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to

3 transmit at least a portion of the data stream to each of the commonly capable
4 output devices.

1 6. The system of claim 3 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit at least a portion of the data stream to each of the commonly capable
4 output devices.

1 7. The system of claim 2 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit at least a portion of the data stream to each of the commonly capable
4 output devices.

1 8. The system of claim 1 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit at least a portion of the data stream to each of the commonly capable
4 output devices.

1 9. The system of claim 6 wherein the computer is programmed to
2 assign, for every data stream, an affinity value to each output device; compare each
3 available output device based upon each of the output devices abilities and any
4 rendering characteristics required by a particular data stream; and to transmit the
5 data stream to an output device which has a highest affinity value.

1 10. The system of claim 5 wherein the computer is programmed to
2 assign, for every data stream, an affinity value to each output device; compare each
3 available output device based upon each of the output devices abilities and any
4 rendering characteristics required by a particular data stream; and to transmit the
5 data stream to an output device which has a highest affinity value.

Exhibit 100-100

1 11. The system of claim 4 wherein the computer is programmed to
2 assign, for every data stream, an affinity value to each output device; compare each
3 available output device based upon each of the output devices abilities and any
4 rendering characteristics required by a particular data stream; and to transmit the
5 data stream to an output device which has a highest affinity value.

1 12. The system of claim 3 wherein the computer is programmed to
2 assign, for every data stream, an affinity value to each output device; compare each
3 available output device based upon each of the output devices abilities and any
4 rendering characteristics required by a particular data stream; and to transmit the
5 data stream to an output device which has a highest affinity value.

1 13. The system of claim 12 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 14. The system of claim 11 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 15. The system of claim 10 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

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1 16. The system of claim 9 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 17. The system of claim 8 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 18. The system of claim 7 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 19. The system of claim 6 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 20. The system of claim 5 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 27. The system of claim 19 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 28. The system of claim 18 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 29. The system of claim 16 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 30. The system of claim 13 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 31. The system of claim 12 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 32. The system of claim 9 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 33. The system of claim 7 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 34. The system of claim 6 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 35. The system of claim 3 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 36. The system of claim 2 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

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1 37. The system of claim 36 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 38. The system of claim 35 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 39. The system of claim 34 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 40. The system of claim 33 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 41. The system of claim 32 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 42. The system of claim 31 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 43. The system of claim 30 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 44. The system of claim 29 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 45. The system of claim 28 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 46. The system of claim 27 further comprising an output device
2 which is a separate system for delivering documents across a network.

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1 47. The system of claim 26 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 48. The system of claim 25 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 49. The system of claim 24 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 50. The system of claim 23 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 51. The system of claim 22 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 52. The system of claim 21 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 53. The system of claim 20 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 54. The system of claim 19 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 55. The system of claim 18 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 56. The system of claim 17 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 57. The system of claim 16 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 58. The system of claim 15 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 59. The system of claim 14 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 60. The system of claim 13 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 61. The system of claim 12 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 62. The system of claim 11 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 63. The system of claim 10 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 64. The system of claim 9 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 65. The system of claim 8 further comprising an output device
2 which is a separate system for delivering documents across a network.

1 66. The system of claim 7 further comprising an output device
2 which is a separate system for delivering documents across a network.

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1 80. The system of claim 65 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 81. The system of claim 64 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 82. The system of claim 63 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 83. The system of claim 62 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 84. The system of claim 61 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 85. The system of claim 60 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 86. The system of claim 59 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 87. The system of claim 58 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 88. The system of claim 57 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 89. The system of claim 56 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 90. The system of claim 55 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 91. The system of claim 54 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 92. The system of claim 53 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 93. The system of claim 52 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 94. The system of claim 51 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

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1 95. The system of claim 50 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 96. The system of claim 49 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 97. The system of claim 48 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 98. The system of claim 47 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 99. The system of claim 46 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

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1 100. The system of claim 45 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 101. The system of claim 44 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 102. The system of claim 43 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 103. The system of claim 42 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 104. The system of claim 41 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

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1 105. The system of claim 40 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 106. The system of claim 39 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 107. The system of claim 38 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 108. The system of claim 37 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 109. The system of claim 36 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

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1 110. The system of claim 35 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 111. The system of claim 34 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 112. The system of claim 33 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 113. The system of claim 32 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 114. The system of claim 31 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 120. The system of claim 25 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 121. The system of claim 24 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 122. The system of claim 23 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 123. The system of claim 22 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 124. The system of claim 21 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

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1 130. The system of claim 15 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 131. The system of claim 14 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 132. The system of claim 13 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 133. The system of claim 12 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 134. The system of claim 11 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 135. The system of claim 10 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 136. The system of claim 9 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 137. The system of claim 8 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 138. The system of claim 7 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 139. The system of claim 6 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

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1 140. The system of claim 5 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 141. The system of claim 4 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 142. The system of claim 3 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 143. The system of claim 2 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 144. The system of claim 1 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

145. A system for delivering documents across a network which comprises:

- a document generator configured to output a data stream in a format selected from the group of formats consisting of a device specific format and a device independent format;
- a computer configured to receive the data stream from the document generator and programmed to analyze the data stream to determine a best output device by comparing any features required by the data stream with features of any output devices available to the computer; and
- the computer further being programmed to translate the data stream into a device specific data stream for the best output device and to transmit the device specific data stream to the best output device.

146. The system of claim 145 wherein the document generator is further configured to embed data into the data stream indicative of a job ticket containing information including rendering characteristics for a generated document and at least one task.

147. The system of claim 146 wherein the computer is further programmed to determine a best output device based upon an affinity value for each output device and whether a particular output device is capable of producing what the data stream requires.

148. The system of claim 145 wherein the computer is further programmed to determine a best output device based upon an affinity value for each output device and whether a particular output device is capable of producing what the data stream requires.

149. The system of claim 148 wherein the output device includes a plurality of commonly capable output devices and the computer is programmed to

transmit at least a portion of the data stream to each of the commonly capable output devices.

150. The system of claim 147 wherein the output device includes a plurality of commonly capable output devices and the computer is programmed to transmit at least a portion of the data stream to each of the commonly capable output devices.

151. The system of claim 146 wherein the output device includes a plurality of commonly capable output devices and the computer is programmed to transmit at least a portion of the data stream to each of the commonly capable output devices.

152. The system of claim 145 wherein the output device includes a plurality of commonly capable output devices and the computer is programmed to transmit at least a portion of the data stream to each of the commonly capable output devices.

153. The system of claim 150 wherein the computer is programmed to assign, for every data stream, an affinity value to each output device; compare each available output device based upon each of the output devices abilities and any rendering characteristics required by a particular data stream; and to transmit the data stream to an output device which has a highest affinity value.

154. The system of claim 149 wherein the computer is programmed to assign, for every data stream, an affinity value to each output device; compare each available output device based upon each of the output devices abilities and any rendering characteristics required by a particular data stream; and to transmit the data stream to an output device which has a highest affinity value.

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1 160. The system of claim 153 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 161. The system of claim 152 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 162. The system of claim 151 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 163. The system of claim 150 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 164. The system of claim 149 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

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1 165. The system of claim 148 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 166. The system of claim 147 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 167. The system of claim 146 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 168. The system of claim 145 wherein the output device includes a
2 plurality of commonly capable output devices and the computer is programmed to
3 transmit the data stream to each of the commonly capable output devices to
4 distribute production of multiple copies of a document out across the commonly
5 capable output devices.

1 169. The system of claim 167 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 170. The system of claim 166 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

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1 171. The system of claim 163 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 172. The system of claim 162 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 173. The system of claim 160 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 174. The system of claim 157 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 175. The system of claim 156 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 176. The system of claim 153 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 177. The system of claim 151 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 178. The system of claim 150 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 179. The system of claim 147 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 180. The system of claim 146 wherein embedded data includes
2 multiple tasks and each of the tasks is destined for a different output device.

1 219. The system of claim 214 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 220. The system of claim 213 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 221. The system of claim 212 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 222. The system of claim 211 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 223. The system of claim 210 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

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1 224. The system of claim 209 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 225. The system of claim 208 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 226. The system of claim 207 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 227. The system of claim 206 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 228. The system of claim 205 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

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1 229. The system of claim 204 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 230. The system of claim 203 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 231. The system of claim 202 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 232. The system of claim 201 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 233. The system of claim 200 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 234. The system of claim 199 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 235. The system of claim 198 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 236. The system of claim 197 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 237. The system of claim 196 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 238. The system of claim 195 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

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1 244. The system of claim 189 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 245. The system of claim 188 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 246. The system of claim 187 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 247. The system of claim 186 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 248. The system of claim 185 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

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1 249. The system of claim 184 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 250. The system of claim 183 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 251. The system of claim 182 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 252. The system of claim 181 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 253. The system of claim 180 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

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1 259. The system of claim 174 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 260. The system of claim 173 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 261. The system of claim 172 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 262. The system of claim 171 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 263. The system of claim 170 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

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1 264. The system of claim 169 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 265. The system of claim 168 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 266. The system of claim 167 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 267. The system of claim 166 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 268. The system of claim 165 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

Exhibit 100

1 274. The system of claim 159 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 275. The system of claim 158 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 276. The system of claim 157 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 277. The system of claim 156 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 278. The system of claim 155 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

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1 279. The system of claim 154 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 280. The system of claim 153 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 281. The system of claim 152 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 282. The system of claim 151 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

1 283. The system of claim 150 wherein the document generator is
2 configured to embed the name of a recipient for a document as opposed to specific
3 device information; and wherein the computer is configured and programmed to
4 deliver the document to a device based upon the recipient's name and any rendering
5 characteristics required by the data stream.

ABSTRACT

A system of networked computers and peripherals and document delivery software which provides a user with a familiar simple user interface to deliver documents to a variety of different destinations. Each document generation device participating in the system is provided with a unified print driver which

10 translates an electronic document into a non-specific or printer independent printer language file and appends to this file a job ticket containing any other rendering characteristics which may not be supported by the printer independent language. This entire file is then transmitted to the system server which analyzes the file, including the rendering characteristics; determines the best output device(s);

15 appends output device specific commands to the general printer language file; and transmits this file to the device(s) for final output.

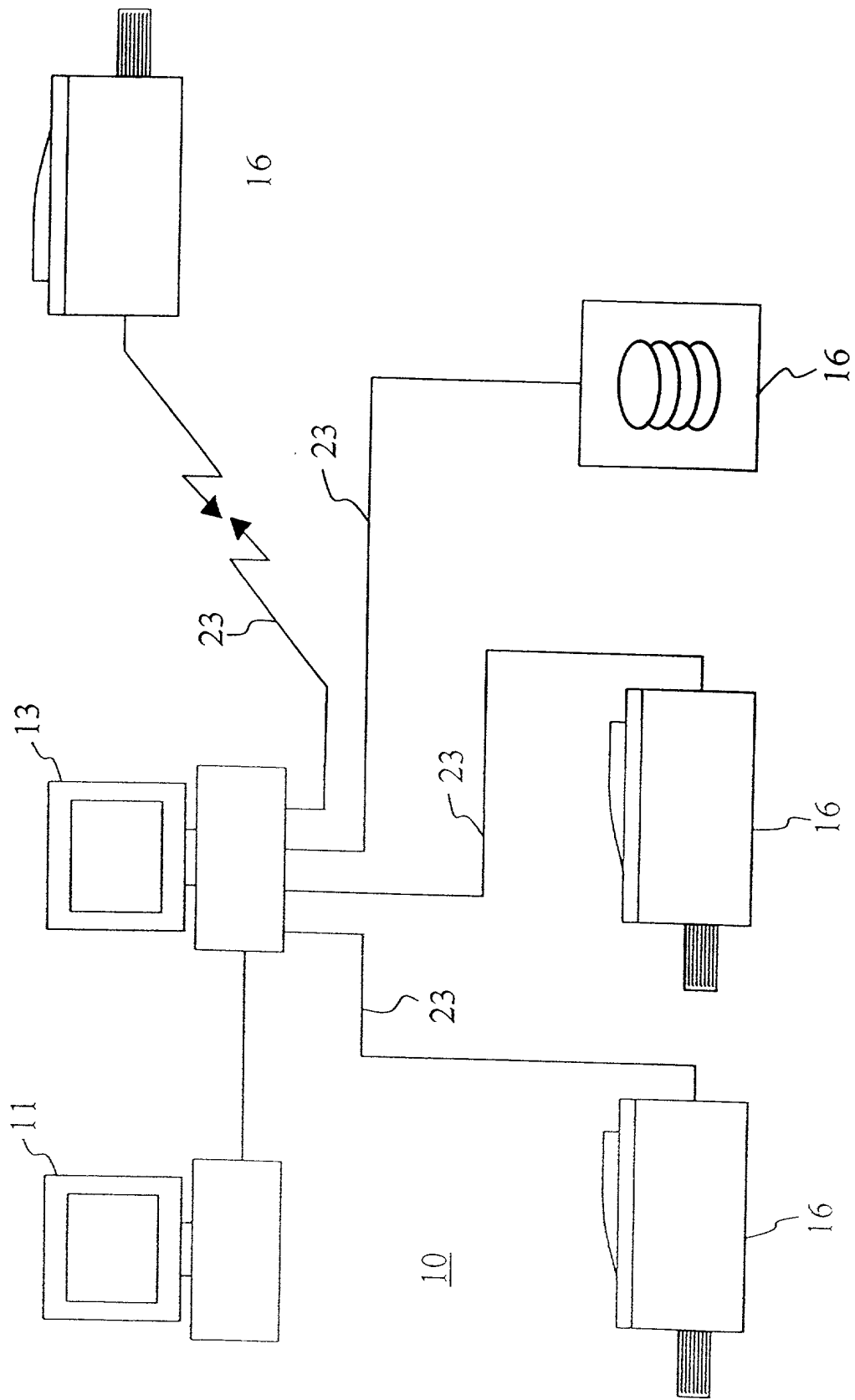


Fig. 1

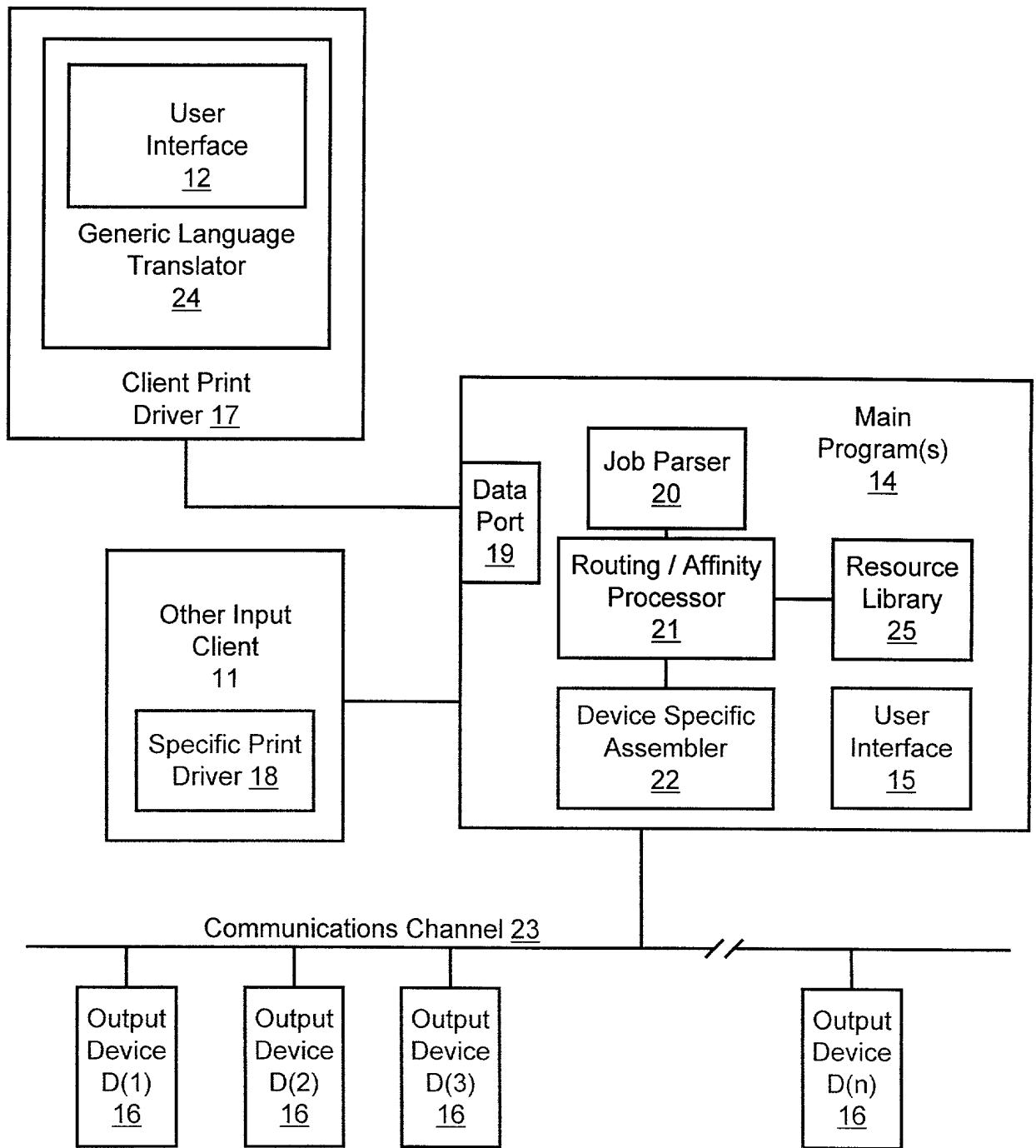


Fig. 2

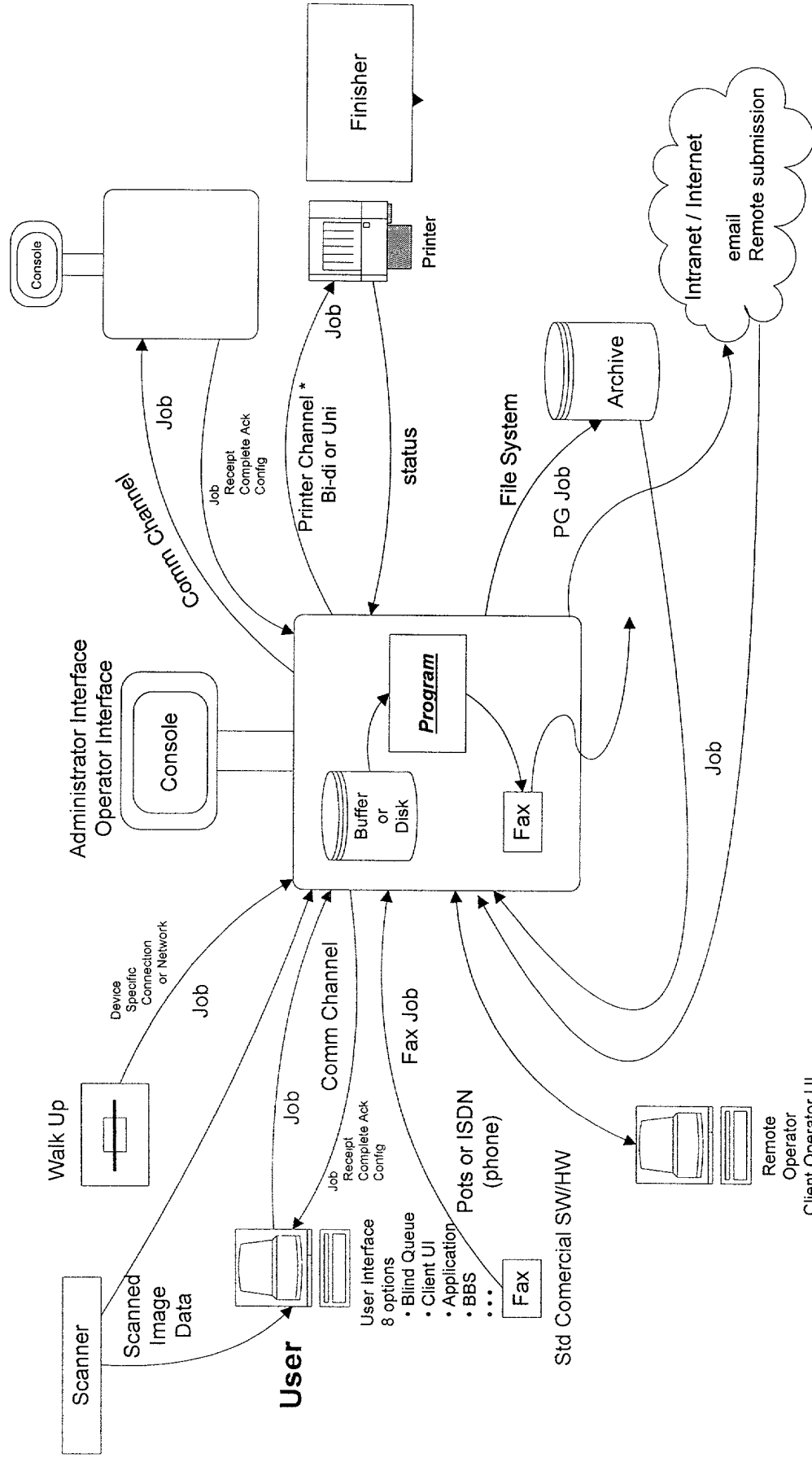


Fig. 3

```

classDiagram
    class OPERATOR
    class OPERATOR_UI["OPERATOR UI"]
    class RESOURCE_LIBRARY
    class PROFILE
    class JOB
    class DATA_PORT
    class DATA_SOURCE
    class USER
    class DEVICE
    class TASK
    class RECIPIENT
    class PRODUCT
    class ACTIVITY_LOG["ACTIVITY LOG"]

    OPERATOR --> OPERATOR_UI : interacts with
    OPERATOR --> RESOURCE_LIBRARY : manages
    OPERATOR --> PROFILE : manages
    OPERATOR --> JOB : manages
    OPERATOR --> DATA_PORT : manages
    OPERATOR --> DEVICE : manages
    OPERATOR --> ACTIVITY_LOG : writes to
    OPERATOR --> ACTIVITY_LOG : verifies to
    OPERATOR --> ACTIVITY_LOG : retrieves

    OPERATOR_UI --> PROFILE : manages
    OPERATOR_UI --> JOB : manages
    OPERATOR_UI --> DATA_PORT : manages
    OPERATOR_UI --> DEVICE : manages
    OPERATOR_UI --> ACTIVITY_LOG : writes to
    OPERATOR_UI --> ACTIVITY_LOG : verifies to
    OPERATOR_UI --> ACTIVITY_LOG : retrieves

    PROFILE --> JOB : is attached
    PROFILE --> DATA_PORT : writes to
    PROFILE --> DEVICE : writes to
    PROFILE --> ACTIVITY_LOG : writes to
    PROFILE --> ACTIVITY_LOG : verifies to
    PROFILE --> ACTIVITY_LOG : retrieves

    JOB --> DATA_PORT : submits
    JOB --> DATA_PORT : writes to
    JOB --> DEVICE : writes to
    JOB --> ACTIVITY_LOG : writes to
    JOB --> ACTIVITY_LOG : verifies to
    JOB --> ACTIVITY_LOG : retrieves

    DATA_PORT --> DATA_SOURCE : receives from
    DATA_PORT --> DEVICE : writes to
    DATA_PORT --> ACTIVITY_LOG : writes to
    DATA_PORT --> ACTIVITY_LOG : verifies to
    DATA_PORT --> ACTIVITY_LOG : retrieves

    DATA_SOURCE --> USER : used by
    DATA_SOURCE --> ACTIVITY_LOG : writes to
    DATA_SOURCE --> ACTIVITY_LOG : verifies to
    DATA_SOURCE --> ACTIVITY_LOG : retrieves

    DEVICE --> TASK : parent
    DEVICE --> TASK : child
    DEVICE --> TASK : child_of
    DEVICE --> RECIPIENT : writes to
    DEVICE --> ACTIVITY_LOG : writes to
    DEVICE --> ACTIVITY_LOG : verifies to
    DEVICE --> ACTIVITY_LOG : retrieves

    RECIPIENT --> PRODUCT : writes to
    RECIPIENT --> ACTIVITY_LOG : writes to
    RECIPIENT --> ACTIVITY_LOG : verifies to
    RECIPIENT --> ACTIVITY_LOG : retrieves

    PRODUCT --> ACTIVITY_LOG : writes to
    PRODUCT --> ACTIVITY_LOG : verifies to
    PRODUCT --> ACTIVITY_LOG : retrieves
  
```

Fig. 4

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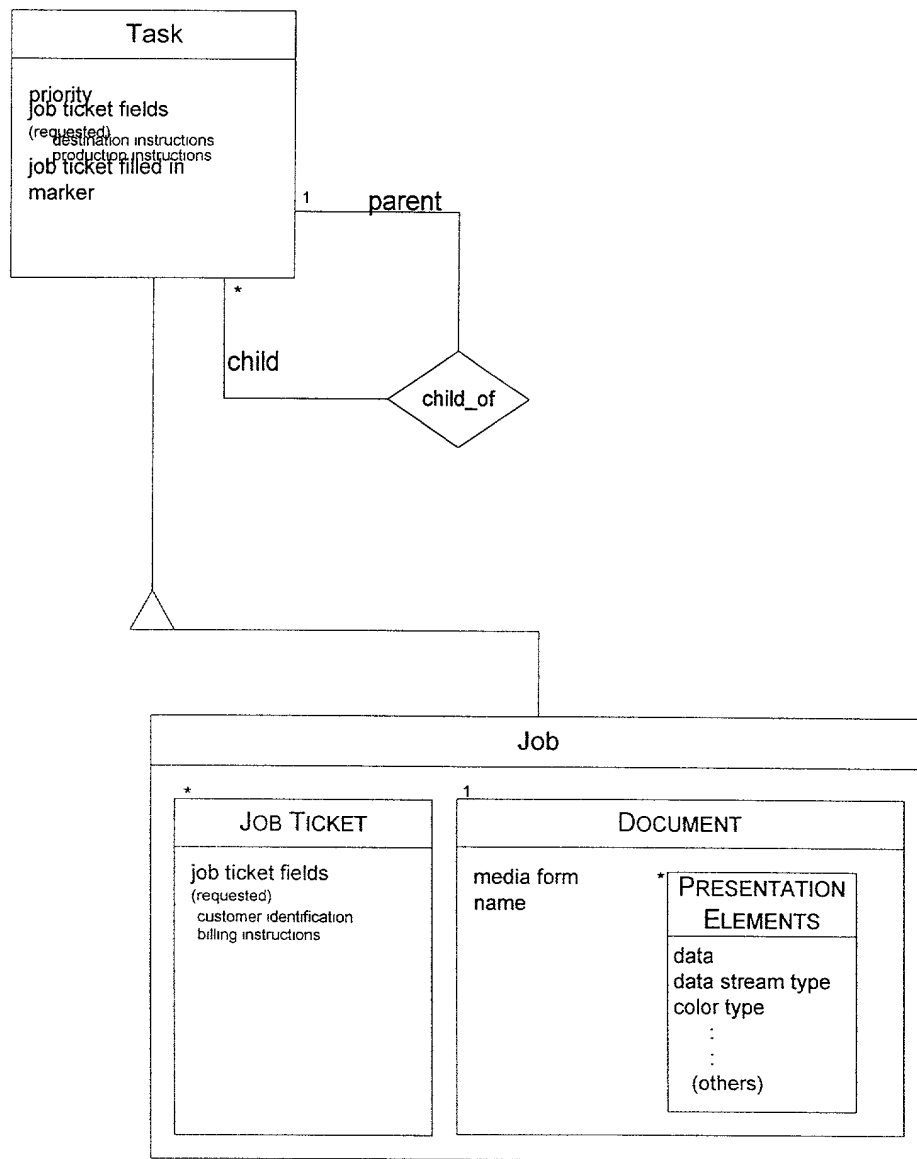


Fig. 5

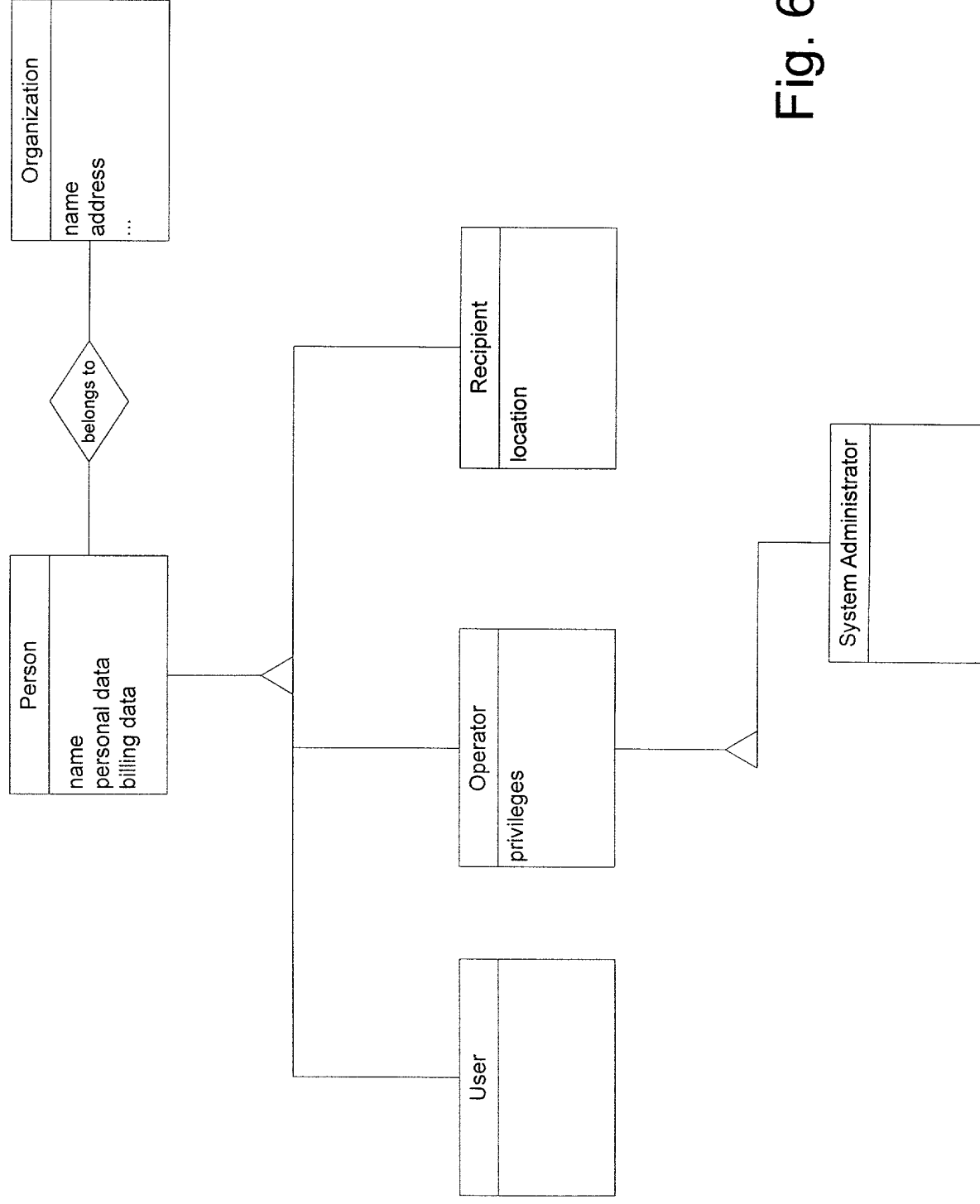


Fig. 6

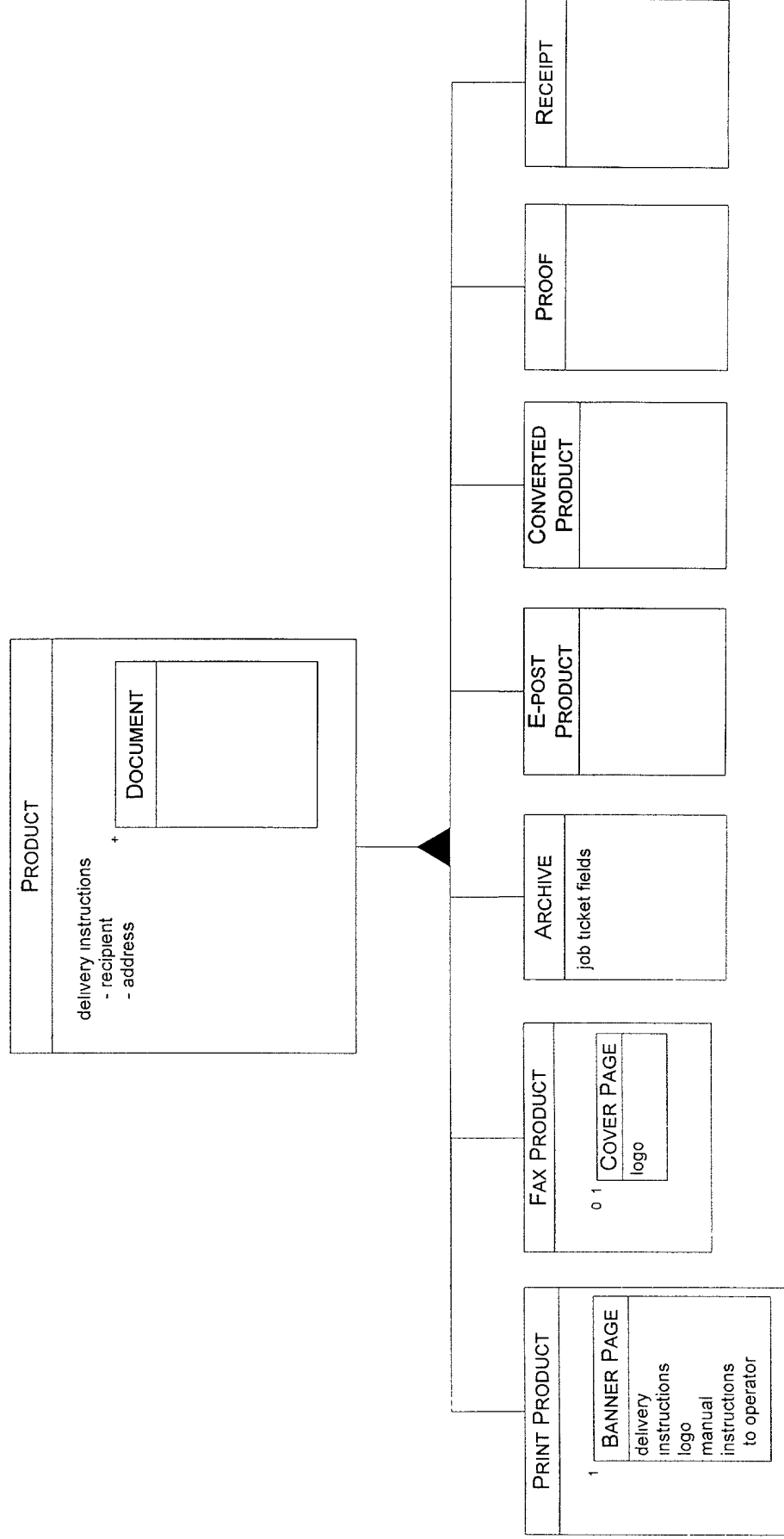


Fig. 7

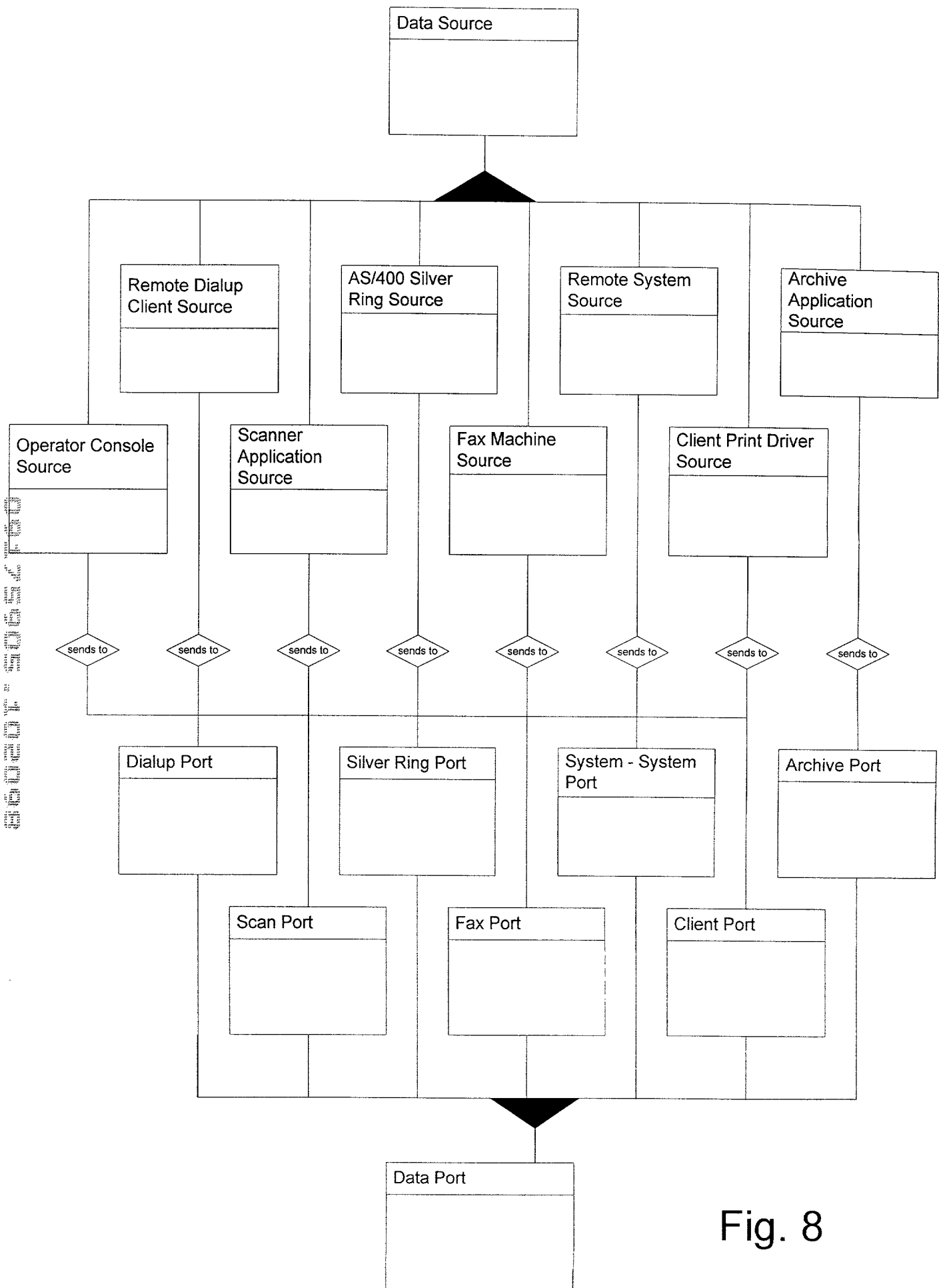


Fig. 8

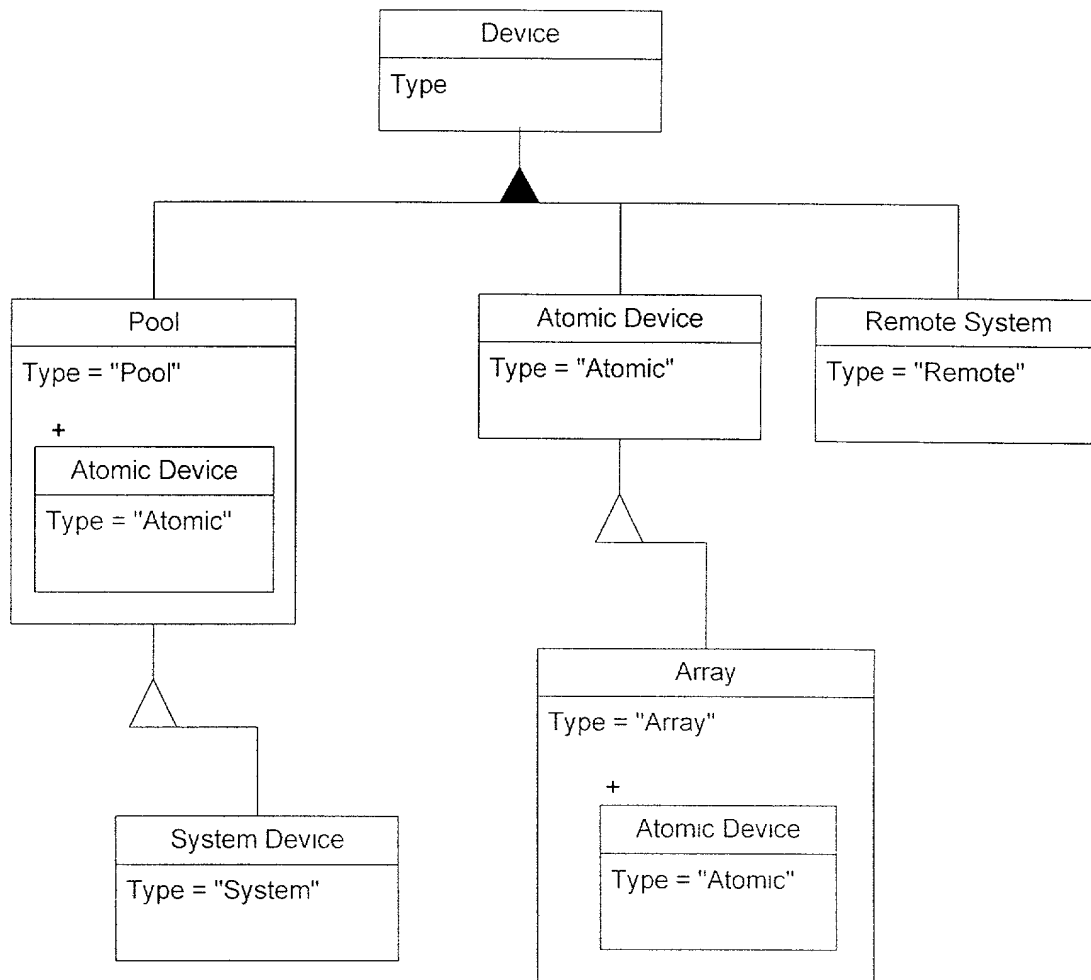


Fig. 9

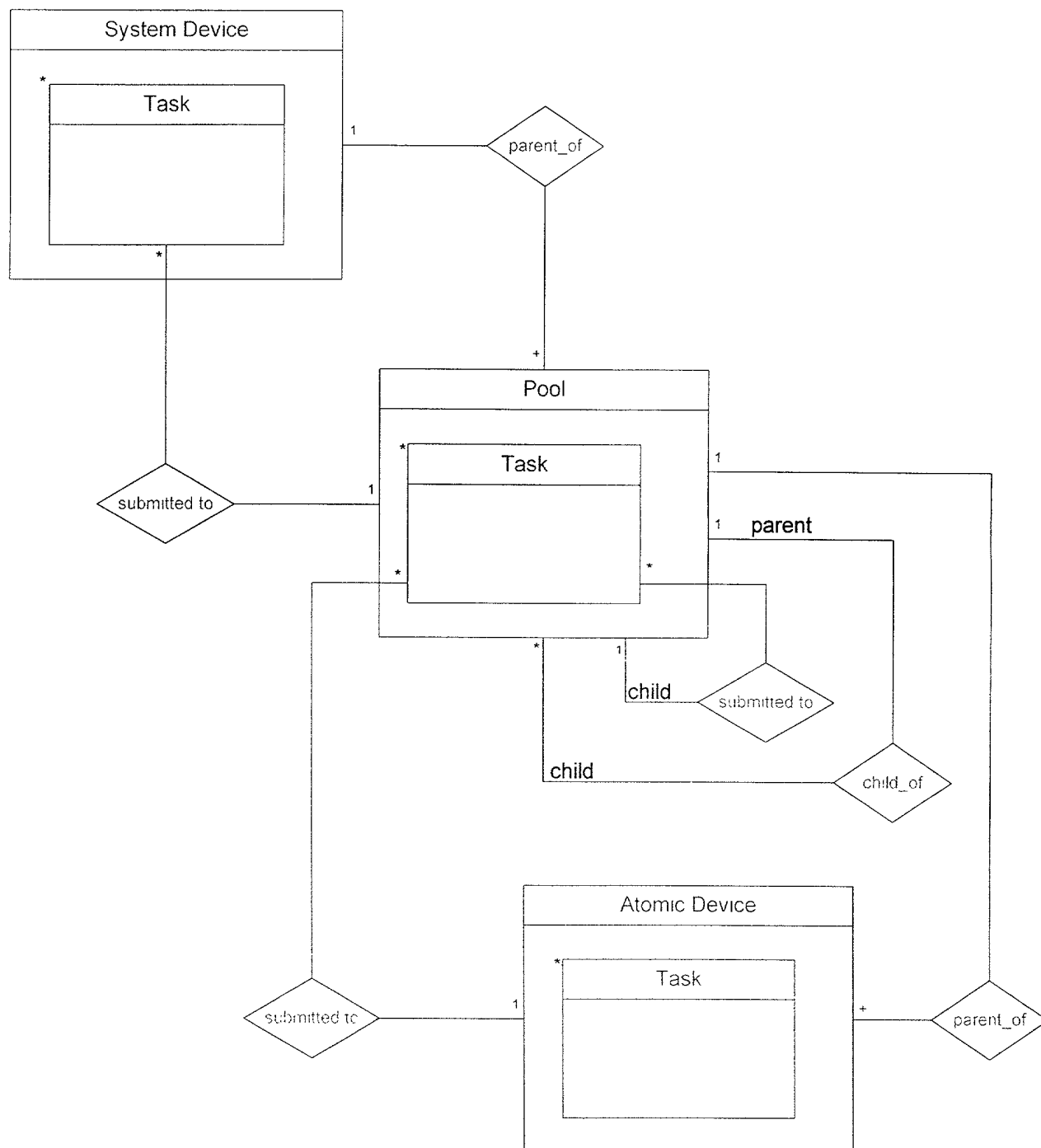


Fig. 10

```

life-cycle    PrintGate:  (
                    ( startup . #device_log_record ) .
                    ( Production~ || Operation* || ResourceDelivery~ ) .
                    ( shutdown . #device_log_record )
                )*

Production     =      submit_job .
                ( #needs_attention . #job_log_record )* .
                ( #needs_resource . #job_log_record )* .
                ( #proof . #job_log_record )* .
                ( #product . #receipt . #job_log_record . #task_log_record+ )

Operation      =      Administration | ControlPrintGate

ResourceDelivery =      ( deliver_resource | deliver_resource_unavailable ) .
                        #resource_log_record

Administration =      DeviceMgmt | PortMgmt
                    ControlPrintGate =      ( enter_job_password .
                    #job_log_record ) |
                    ( generate_encryption_key_pair . #generate_key_log_record ) |
                    JobMgmt |
                    TaskMgmt |
                    ProfileMgmt |
                    WorkQuery

DeviceMgmt     =      (
                    (
                        add_device |
                        move_device |
                        copy_device |
                        change_device |
                        remove_device |
                        hold_device |
                        release_device |
                        ( query_device_configuration . #display_device_configuration )
                    ) .
                    #device_log_record
                ) |
                WorkQuery

```

Fig. 11

```

PortMgmt    =    (
                add_port |
                change_port |
                delete_port |
                hold_port |
                release_port |
                ( query_port . #port_properties )
            ).
            #port_log_record

JobMgmt     =    (
                change_job_information |
                delete_job |
                ( view_job_document . #document_view ) |
                ( query_job_information . #job_information )
            ).
            #job_log_record

TaskMgmt    =    ( add_task |
                change_task |
                cancel_task |
                hold_task |
                release_task |
                ( query_task . #display_task_properties ) ).
            #task_log_record

ProfileMgmt =    (
                create_profile |
                change_profile |
                delete_profile |
                ( query_profile . #display_profile_properties )
            ).
            #profile_log_record

WorkQuery   =    ( query_device_status . #display_device_status .
            #device_log_record )

```

Fig. 12

Operation Schema Listings

Operation Schema: Add Device

Operation: `add_device`

Description: Adds a new device to the PrintGate system.

Reads: **supplied** name: `device_name`,
 supplied privilege
 supplied new_parent : `device_name`
 parent_id: `new_parent.id`

Changes: **new** new_device : `device`,
 new new_link : `is_child_of`

Sends: `activity_log:{device_log_record}`

Assumes:

Result: If privilege allows, and
 if new_parent.type is not atomic, and
 if new_device.type will not be 'system'
 then
 new_device.name has been initialized to `device_name`.
 new_device.id has been set to default value.
 new_device.characteristics and new_device.priority have been
 set to default values,
 new_link.parent has been set to `new_parent.id`,

Fig. 13

new_link.child has been set to new_device.id.

device_log_record has been sent to the activity_log

new_device_id = new_device.id

Fig. 14

Operation Schema: Add Port

Operation: add_port

Description: Operator adds a Data Port to the system.

Reads: supplied port_name,
 supplied port_configuration,
 supplied privileges.

Changes: new Data_Port

Sends: Activity Log:{port_log_record}

Assumes:

Result: If port_name does not refer to any existing ports, and privileges
allows this

operation then,

 A new Data_Port has been added to the system.

 Data_Port.name has been set to port_name.

 Data_Port.configuration has been set to port_configuration.

 Data_Port.held has been cleared.

port_log_record has been sent to the Activity Log

Fig. 15

Operation Schema: Add Task

Operation: `add_task`

Description: Adds a new task for a job on to the system device.

Reads: `supplied task_instructions,`
 `supplied job_id,`
 `supplied privileges,`
 `job with job.id = job_id.`

Changes: `new task,`
 `device with device.type = "system".`

Sends: `activity_log: {task_log_record}`

Assumes:

Result: If privileges allow this operation and
 `job_id` identifies a job with `job.id = job_id` then
 A new Task has been added to the system Device,
 Task.job_id has been set to `job_id`,
 Task.instructions have been set to `task_instructions`.

`task_log_record` has been sent to the `activity_log`.

Fig. 16

Operation Schema: Cancel Task

Operation: `cancel_task`

Description: Removes a job's task from the system

Reads: `supplied task_id`
 `supplied privileges`

Changes: `delete Task with task.id = task_id`
 `device with device_id = task.device_id`

Sends: `activity log: {task_log_record}`

Assumes:

Result: If privileges allows this operation then
 task has been removed from device.

`task_log_record` has been sent to the activity log.

Fig. 17

Operation Schema: Change Device

Operation: `change_device`

Description: Changes a device's name, characteristics and priority.

Reads: `supplied old_name : device_name`
 `supplied new_name: device_name,`
 `supplied new_characteristics : characteristics,`
 `supplied new_priority : priority,`
 `supplied privilege`
 `supplied dev_id : device_id`

Changes: `changed_device : device with device.name=old_name and`
 `device.id=dev_id`

Sends: `activity_log:{device_log_record}`

Assumes:

Result: If privilege allows and
 if `changed_device.hold` is set, then
 `changed_device.name` has been set to `new_name`.
 `changed_device.characteristics` has been set to
 `new_characteristics`.
 `changed_device.priority` has been set to `new_priority`.

 `device_log_record` has been sent to the `activity_log`

Fig. 18

Operation Schema: Change Job Information

Operation: `change_job_information`

Description: Operator changes customer and billing information for a given job.

Reads: **supplied** job_identification,
 supplied new_billing_information,
 supplied new_customer_information
 supplied privileges.

Changes: Job with Job_id = job_identification

Sends: Activity Log: {job_record(s)}

Assumes: The new billing and customer information is valid.

Result: If privileges allows operation then,
 Job.billing_information has been set to new_billing_information.
 Job.customer_information has been set to
new_customer_information.

job_record(s) has been sent to the Activity Log.

Fig. 19

Operation Schema: Change Port

Operation: `change_port`

Description: Operator changes the configuration of a Data Port

Reads: **supplied** `old_port_name`,
 supplied `new_port_name`,
 supplied `new_configuration`,
 supplied privileges.

Changes: Initial `Data_Port` with `Data_Port.name = old_port_name`.

Sends: ``Activity Log:{port_log_record}`

Assumes:

Result: If `new_port_name` does not refer to any existing ports,
 privileges allows operation, and
 `Data_Port.held` is set then,
 Final `Data_Port.name` has been set to `new_port_name`.
 Final `Data_Port.configuration` has been set to
`new_configuration`.

`port_log_record` has been sent to the Activity Log

Fig. 20

Operation Schema: Change Profile

Operation: `change_profile`

Description: Changes the attributes of an existing customer/user profile.

Reads: **supplied** `old_name`,
 supplied `new_name`,
 supplied `capabilities`,
 supplied `new_default_job_ticket`,
 supplied `privileges`.

Changes: `profile` with `profile.name = old_name`

Sends: `activity_log: {profile_log_record}`

Assumes:

Result: If `new_name` does not refer to any existing `profile.name` and
 `privileges` allows

 this operation then

`Profile.name` is set to `new_name`,

`Profile.capabilities` is set to `new_capabilities`,

`Profile.default_job_ticket` is set to `new_default_job_ticket`.

`profile_log_record` has been sent to the `activity_log`.

Fig. 21

Operation Schema: Change Task

Operation: `change_task`

Description: Changes a task's attributes or device assignment

Reads: `supplied task_id`,
 `supplied new_instructions`,
 `supplied privileges`.

Changes: Task with `Task.id = task_id`,
 `original_device: Initial` device with `device.id = task.device_id`,
 `system_device: device` with `device.type = "system"`.

Sends: `activity_log: {task_log_record}`

Assumes:

Result: If privileges allows this operation then
 Task.instructions has been set to `new_instructions`.
 Task.hold_status has been set on. *
 If *Final* Task.instructions can not be performed on
original_device then
 Task has been removed from original_device,

Fig. 22

Operation Schema: Copy Device

Operation: `copy_device`

Description: Copies a device to a different pool.

Reads: `supplied new_parent : device_id`
 `supplied child_id : device_id`
 `supplied privilege`
 `parent : device with device.id = new_parent`
 `child : device with device.id = child_id`

Changes: `new new_link : is_child_of`

Sends: `activity_log:{device_log_record}`

Assumes:

Result: If privilege allows, and
 if child has not become an ancestor of child, and
 if parent.type is not atomic, and
 if child.type is not system,
 then
 `new_link.parent` has been set to `new_parent` and
 `new_link.child` has been set to `child_id`.

Fig. 24

device_log_record has been sent to the activity_log

device_log_record has been sent to the activity_log

Fig. 25

Operation Schema: Create Profile

Operation: `create_profile`

Description: Adds a new customer/user profile to the system.

Reads: `supplied name`,
 `supplied privileges`.

Changes: `new profile`

Sends: `activity_log: {profile_log_record}`

Assumes:

Result: If name does not refer to any existing profile.name and
 privileges allows this

 operation then

 A new profile has been added to the system,

 Profile.name has been set to name,

 Profile.capabilities has been set to profile.capabilities from

profile with

 profile with profile.name = "Default".

 profile_log_record has been sent to the activity_log.

Fig. 26

Operation Schema: Delete Job

Operation: delete_job

Description: Operator deletes a Job and all of its associated Tasks from the system.

Reads: supplied job_identification,
supplied privileges.

Changes: delete Job with Job.id = job_identification,
delete all Tasks with Task.job_id = job_identification,
for each Task above,
Device with Device.id = Task.device_id.

Sends: Activity Log: {job_log_record}

Assumes:

Result: If privileges allows operation then,
Job has been removed from system.
All Tasks associated with Job have been removed from their
respective
devices.

job_log_record has been sent to Activity Log.

Fig. 27

Operation Schema: Delete Port

Operation: `delete_port`

Description: Operator removes a Data Port from the system.

Reads: `supplied port_name`,
 `supplied privileges`.

Changes: `delete Data_Port with Data_Port.name = port_name`.

Sends: Activity Log: `{port_log_record}`

Assumes:

Result: If privileges allows the operation, and `Data_Port.held` is set
then,

 The `Data_Port` with `Data_Port.name = port_name` has been removed
 from
 the system.

`port_log_record` has been sent to the Activity Log.

Fig. 28

Operation Schema: Delete Profile

Operation: `delete_profile`

Description: Remove an existing customer/user profile from the system.

Reads: `supplied name,`
 `supplied privileges.`

Changes: `delete profile with profile.name = name.`

Sends: `activity_log: {profile_log_record}`

Assumes:

Result: If privileges allows this operation then
 named profile is removed from the system.

`profile_log_record` has been sent to the `activity_log`.

Fig. 29

Operation Schema: Deliver Resource

Operation: `deliver_resource`

Description: Resource Library delivers a Resource to a Device that is processing a Task.

Reads: `supplied device_name`,
 `supplied resource_name`,
 `supplied resource_type`,
 `supplied resource_data`.

Changes: Device with `Device.name = device_name`.

Sends: Activity Log: {`job_log_record`}

Assumes:

Result: If `Device.processes.resource_name` is `resource_name`,
 `Device.processes.resource_type` is `resource_type`, and
 `Device.processes.resource_data` is NULL then,
 `Device.processes.resource_data` has been set to
`resource_data`.

`job_log_record` has been sent to the Activity Log.

Fig. 30

Operation Schema: Deliver Resource Unavailable

Operation: deliver_resource_unavailable

Description: Resource Library indicates that a Resource needed by a Device that is processing a Task
cannot be delivered.

Reads: supplied device_name,
supplied resource_name,
supplied resource_type,
Device with Device.name = device_name.

Changes: Task with Taks.id = Device.task_id.

Sends: Activity Log:{job_log_record}
Operator:{attention_required}

Assumes:

Result: If Device.processes.resource_name is set to resource_name,
Device.processes.resource_type is set to resource_type, and
Device.processes.resource_data is set to NULL then,
Task.held has been set.
Task.intervention_required has been set.
attention_required has been sent to the Operator.

job_log_record has been sent to the Activity Log

Fig. 31

Operation Schema: Enter Job Password

Operation: enter_job_password

Description: Operator enters password to allow Job to be processed.

Reads: supplied job_identification,
 supplied password,
 supplied privileges.

Changes: Job with Job.id = job_identification

Sends: Activity Log: {job_log_record}

Assumes:

Result: If operator_privileges allows operation, and
 Job.password_required is set, and
 Job.password is set to password then,
 Job.password_required is cleared.

job_log_record has been sent to Activity Log.

Fig. 32

Operation Schema: Generate Encryption Key Pair

Operation: generate_encryption_key_pair

Description: Operator generates a encryption/decryption key pair for job encryption.

Reads: supplied privileges,
supplied profile_name.

Changes: Profile with Profile.name = profile_name

Sends: Operator: {public_decryption_key},
Activity Log: {profile_log_record}.

Assumes:

Result: If privileges allows the operation then,
A encryption/decryption key pair has been generatred.
Profile.encryption_key has been set to the encryption key.
Profile.decryption_key has been set to the decryption key.
The decryption key has been sent to the Operator.

profile_log_record has been sent to the Activity Log

Fig. 33

Operation Schema: Hold Device

Operation: `hold_device`

Description: Pauses a device's execution

Reads: `supplied dev_id: device_id`
 `supplied privilege`

Changes: `held_device` : device with `device.id` equal to `dev_id`

Sends: `activity_log:{device_log_record}`

Assumes:

Result: If privilege allows, and `device.hold_status` for `held_device` is
cleared, then

 The `device.hold_status` for `held_device` has been set.

`device_log_record` has been sent to the `activity_log`

Fig. 34

Operation Schema: Hold Port

Operation: **hold_port**

Description: Operator holds a Data Port to prevent Job submission.

Reads: **supplied port_name ,**
 supplied privileges.

Changes: Data_Port with Data_Port.name = port_name.

Sends: Activity Log:{port_log_record}

Assumes:

Result: If Data_Port.held is not set, and privileges allows operation
then,

 Data_Port.held has been set.

port_log_record has been sent to the Activity Log.

Fig. 35

Operation Schema: Hold Task

Operation: `hold_task`

Description: Places a task on hold so that it will not continue to be processed.

Reads: `supplied task_id`,
 `supplied privileges`.

Changes: task with `task.id = task_id`

Sends: `activity_log: {task_log_record}`

Assumes:

Result: If privileges allows this operation and
 if *Initial* `task.hold_status` is cleared then
 Final `task.hold_status` has been set.

`task_log_record` has been sent to the `activity_log`.

Fig. 36

Operation Schema: Move Device

Operation: `move_device`

Description: Moves a device to a different pool.

Reads: **supplied** `old_parent : device_id`
 supplied `new_parent : device_id`
 supplied `child_id : device_id`
 supplied `privilege`
 `parent : device with device.id = new_parent`
 `child : device with device.id = child_id`

Changes: **new** `new_link : is_child_of`
 delete `old_link : is_child_of with is_child_of.parent = old_parent and`
 `is_child_of.child = child_id`

Sends: `activity_log:{device_log_record}`

Assumes:

Result: If privilege allows, and
 if child has not become an ancestor of child, and
 if `new_parent.type` is not atomic, and
 if `child.type` is not system, and
 if `child.hold` is set,
 then
 `old_link` has been removed and

Fig. 37

Operation Schema: Query Device Configuration

Operation: `query_device_configuration`

Description: Reports the current configuration and properties of a device

Reads: `supplied device_name,`
 `supplied privileges,`
 `device with device.name = device_name.`

Changes:

Sends: `operator: {device_properties}`
 `activity_log: {device_log_record}`

Assumes:

Result: `If privileges allow this operation then`
 `device_properties sent to operator.`

`device_log_record has been sent to the activity_log.`

Fig. 39

Operation Schema: Query Job Information

Operation: `query_job_information`

Description: Reports the current job-level properties of a job

Reads: `supplied job_id`,
 `supplied privileges`,
 `job with job.id = job_id`.

Changes:

Sends: `operator: {job_information}`
 `activity_log: {job_log_record}`

Assumes:

Result: If privileges allow this operation then
 `job_information` sent to operator.

`job_log_record` has been sent to the `activity_log`.

Fig. 41

Operation Schema: Query Port

Operation: query_port

Description: Reports the current properties and status of a data port

Reads: supplied port_name,
 supplied privileges,
 port with port.name = port_name.

Changes:

Sends: operator: {port_properties, port_status}
 activity_log: {port_log_record}

Assumes:

Result: If privileges allow this operation then
 port_properties and port_status sent to operator.

port_log_record has been sent to the activity_log.

Fig. 42

Operation Schema: Query Profile

Operation: `query_profile`

Description: Reports the current properties of a profile

Reads: **supplied** `profile_name`,
 supplied privileges,
 profile with `profile.name = profile_name`.

Changes:

Sends: operator: {`profile_properties`}
 activity_log: {`profile_log_record`}

Assumes:

Result: If privileges allow this operation then
 `profile_properties` sent to operator.

`profile_log_record` has been sent to the `activity_log`.

Fig. 43

Operation Schema: Query Task

Operation: `query_task`

Description: Reports the current properties and status of a task

Reads: **supplied** `task_id`,
 supplied privileges,
 Task with `Task.id = task_id`.

Changes:

Sends: Operator: {`task_properties`, `task_status`}
 activity_log: {`task_log_record`}

Assumes:

Result:

 If privileges allow this operation then
 `task_properties` and `task_status` sent to Operator.

`task_log_record` has been sent to activity_log.

Fig. 44

Operation Schema: Release Device

Operation: `release_device`

Description: Resumes a device's execution after it has been paused.

Reads: `supplied dev_id: device_id,`
 `supplied privilege`

Changes: `released_device : device with device.id equal to device_id`

Sends: `activity_log:{device_log_record}`

Assumes:

Result: If privilege allows, and `device.hold` for `released_device` is set,
then

 The `device.hold` for `released_device` has been cleared.

`device_log_record` has been sent to the `activity_log`

Fig. 45

Operation Schema: Release Port

Operation: `release_port`

Description: Operator releases a Data Port to allow Job submission;

Reads: `supplied port_name`,
 `supplied privileges`.

Changes: `Data_Port` with `Data_Port.name = port_name`.

Sends: Activity Log:{`port_log_record`}

Assumes:

Result: If privileges allows operation then,
 `Data_Port.status` has been set to Ready.

`port_log_record` has been sent to the Activity Log

Fig. 46

Operation Schema: Release Task

Operation: `release_task`

Description: Resumes a task's operation so that it will continue to be processed.

Reads: `supplied task_id`,
 `supplied privileges`.

Changes: `task` with `task.id = task_id`

Sends: `activity_log: {task_log_record}`

Assumes:

Result: If privileges allows this operation and
 if *Initial* `task.hold_status` is set on then
 Final `task.hold_status` has been cleared.

`task_log_record` has been sent to the `activity_log`.

Fig. 47

Operation Schema: Remove Device

Operation: `remove_device`

Description: Removes a device from a pool. If it is the only instance of that device in the system, the device is removed from the PrintGate system.

Reads: **supplied** dev_id: device_id,
 supplied privilege
 supplied parent_id : device_id

Changes: delete link: is_child_of with is_child_of.child = dev_id and
 is_child_of.parent = parent_id
 delete last_device : device with device.id = dev_id

Sends: activity_log:{device_log_record}

Assumes:

Result: If privilege allows and
 if last_device.hold is set, then
 link has been removed and
 If no other is_child_of with is_child_of.child = dev_id then
 last_device has been removed.
 Otherwise, last_device has not been removed.

 device_log_record has been sent to the activity_log

Fig. 48

Operation Schema: Shutdown

Operation: **shutdown**

Description: Shuts down the PrintGate system.

Reads: **supplied privilege**

Changes: system_device : device with device.type equal to 'system'
 all_devices : all devices in the system which have device.hold cleared

Sends:

Assumes:

Result: If privilege allows, and
 if device.availability for system_device has been set then
 system_device has had device.availability cleared
 all_devices has had device.hold set

 device_log_record has been sent to the activity_log.

Fig. 49

Operation Schema: Startup

Operation: startup

Description: Starts the PrintGate system.

Reads: supplied privilege

Changes: system_device : device with device.type equal to 'system'
all_devices : all devices in the system which have device.hold set

Sends: activity_log: {device_log_record}

Assumes:

Result: If privilege allows, and
if device.availability for system_device has not been set then
system_device has had device.availability set.
all_devices has had device.hold cleared
Otherwise, no change occurs.

device_log_record has been sent to the activity_log.

Fig. 50

Operation Schema: Submit Job

Operation: submit_job

Description: Data Source adds a Job to the system.

Reads: **supplied** port_name,
 supplied originator,
 supplied job_ticket,
 supplied document_data,
 Data_Port with Data_Port.name = port_name,
 Profile with Profile.name = originator,
 Profile with Profile.name = port_name,
 Profile with Profile.name = "Default".

Changes: new Job.

Sends: Product: {proof,product,receipt},
 Operator:{processing_job, completed_job, needs_attention},
 Resource Library:{resource_request},
 Activity Log:{job_log_record(s)}.

Assumes: document_data is in a supported PDL.

Result: If Data_Port.held is cleared then,
 A new job has been added to the system.
 Job.instructions, Job.customer_information and
Job.billing_information

Fig. 51

have been set based on the job_ticket.
 Job.document.data has been set to document_data.
 Job.originator has been set to originator.
 If Profile with Profile.name = Job.originator exists then,
 If Job.is_encrypted is set,
 Job.instructions, Job.customer_information,
 Job.billing_information and Job.document_data has
 been decrypted using Profile.decryption_key from Profile
 with Profile.name
 Job.originator.
 Job.instructions, Job.customer_information and
 Job.billing_information has been merged with
 Profile.default_instructions,
 Profile.default_customer_information and
 Profile.default_billing_information respectively from Profile with
 Profile.name = Job.originator.
 Job.priority has been set to Profile.default_priority from Profile
 with
 Profile.name = Job.originator.
 Otherwise if Profile with Profile.name = Job.port exists then,
 If Job.is_encrypted is set,
 Job.instructions, Job.customer_information,
 Job.billing_information and Job.document_data has been decrypted using
 Profile.decryption_key from Profile with Profile.name = Job.port.
 Job.instructions, Job.customer_information and
 Job.billing_information has been merged with
 Profile.default_instructions,
 Operation Schema: Submit Job (Continued)

Fig. 52

Profile.default_customer_information and
 Profile.default_billing_information respectively from Profile with Profile.name
 =
 Job.port.
 Job.priority has been set to Profile.default_priority from Profile
 with
 Profile.name = Job.port.
 Otherwise,
 If Job.is_encrypted is set,
 Job.instructions, Job.customer_information,
 Job.billing_information and Job.document_data has been decrypted using
 Profile.decryption_key from Profile with Profile.name = "Default".
 Job.instructions, Job.customer_information and
 Job.billing_information has been merged with
 Profile.default_instructions,
 Profile.default_customer_information and
 Profile.default_billing_information respectively from Profile
 with Profile.name = "Default".
 Job.priority has been set to Profile.default_priority from Profile
 with
 Profile.name = "Default".
 job_log_record(s) has been sent to the Activity Log.
 processing_job indicator (i.e. lights) has been signaled to the Operator.
 If operator attention was required then,
 needs_intervention indicator (i.e. lights) has been signaled to
 the Operator.
 If external resources were required then,
 resource_request has been sent to the Resource Library.
 Job.status has been set to Done.

Fig. 53

completed_job indicator (i.e. lights) has been signaled to the Operator.
If Job.instructions indicate that a proof was required then,
 A proof has been generated.
The product has been generated.
A receipt has been generated.
Otherwise,
There was no effect on the system.

Fig. 54

Operation Schema: View Job Document

Operation: `view_job_document`

Description: Operator views a representation of the document data of a Job.

Reads: `supplied job_identification`,
 `supplied privileges`,
 Job with `Job.id = job_identification`.

Changes:

Sends: Operator: `{document_representation}`,
 Activity Log: `{job_log_record}`.

Assumes:

Result: If the privileges allows the operation then,
 Job.document_data has been converted into a viewable format.
 The viewable data has been presented to the Operator.

`job_log_record` has been sent to the Activity Log

Fig. 55

Fusion Notation Summary

Object Model Notation

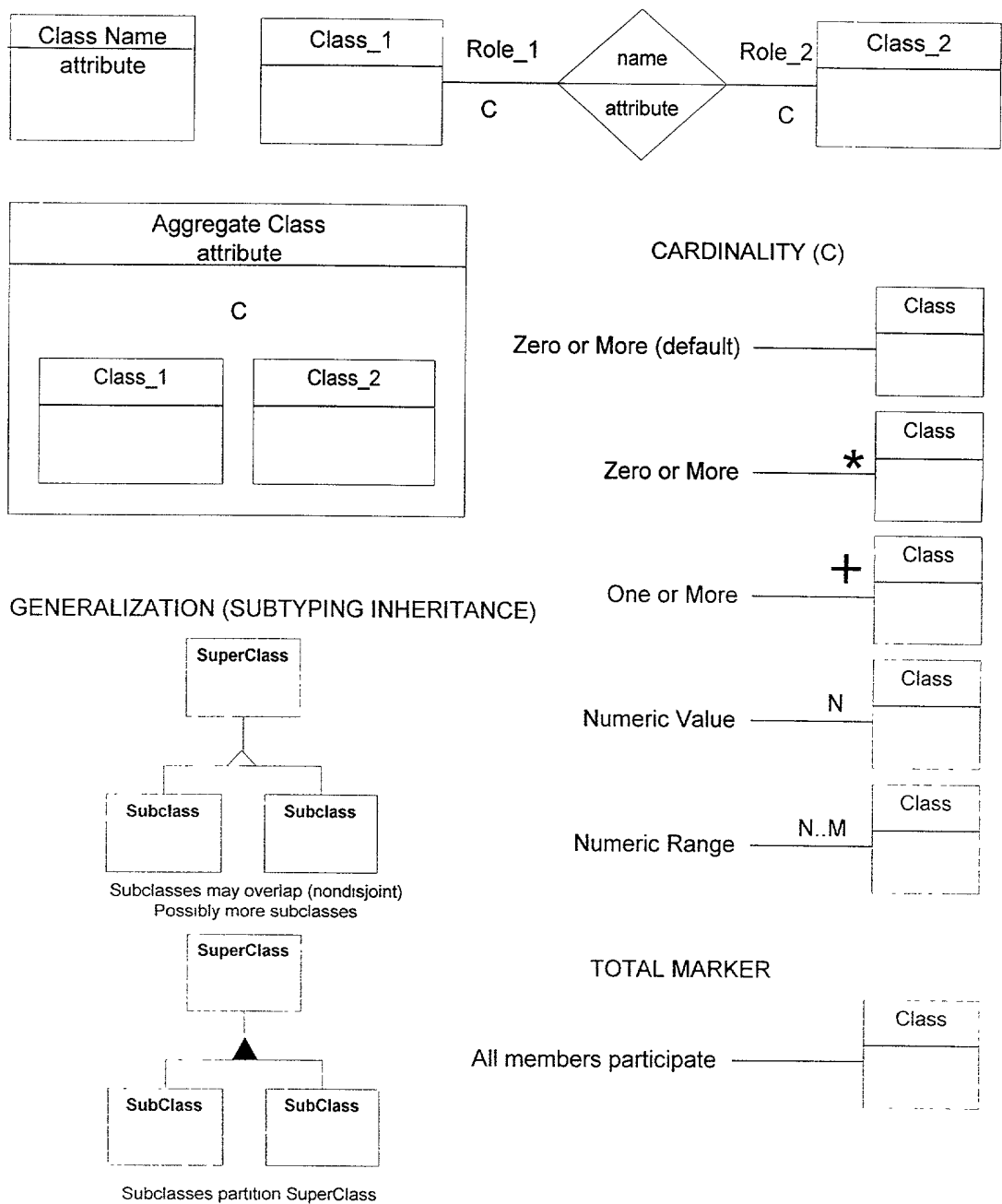


Fig. 56

Life-Cycle Model Notation

life cycle [<i>Name</i> :] <i>Regular Expression</i> (<i>LocalName</i> = <i>Regular Expression</i>)*		
<i>Regular Expressions:</i>	Name	Any event name (operation) ,. Local name, or output event
	Concatenation	<i>x.y</i>
	Alternation	<i>x y</i>
	Repetition	
	Zero or more	<i>x*</i>
	One or more	<i>x+</i>
	Optional	[<i>x</i>]
	Interleaving	
	Grouping	(<i>x</i>)

Operation Model Notation

Operation:	operation identifier
Description:	<text> Description of operation
Reads:	<supplied values> <state components>
Changes:	<supplied values> <state components>
Sends:	<agent communication> <state components>
Assumes:	<assertions> (preconditions)
Result:	<assertions> (preconditions)

Fig. 57

Object Interaction Graph Notation

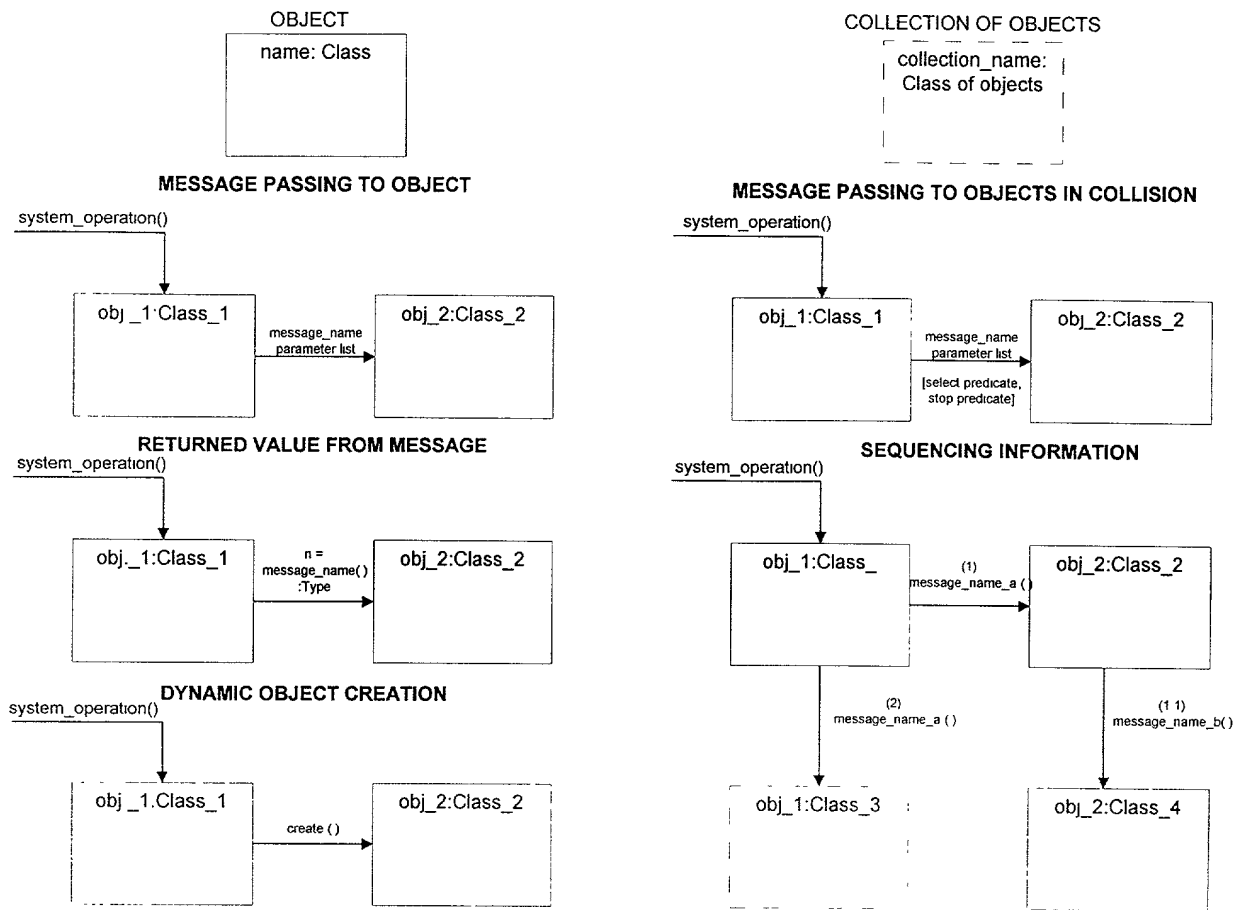


Fig. 58

Visibility Graph Notation

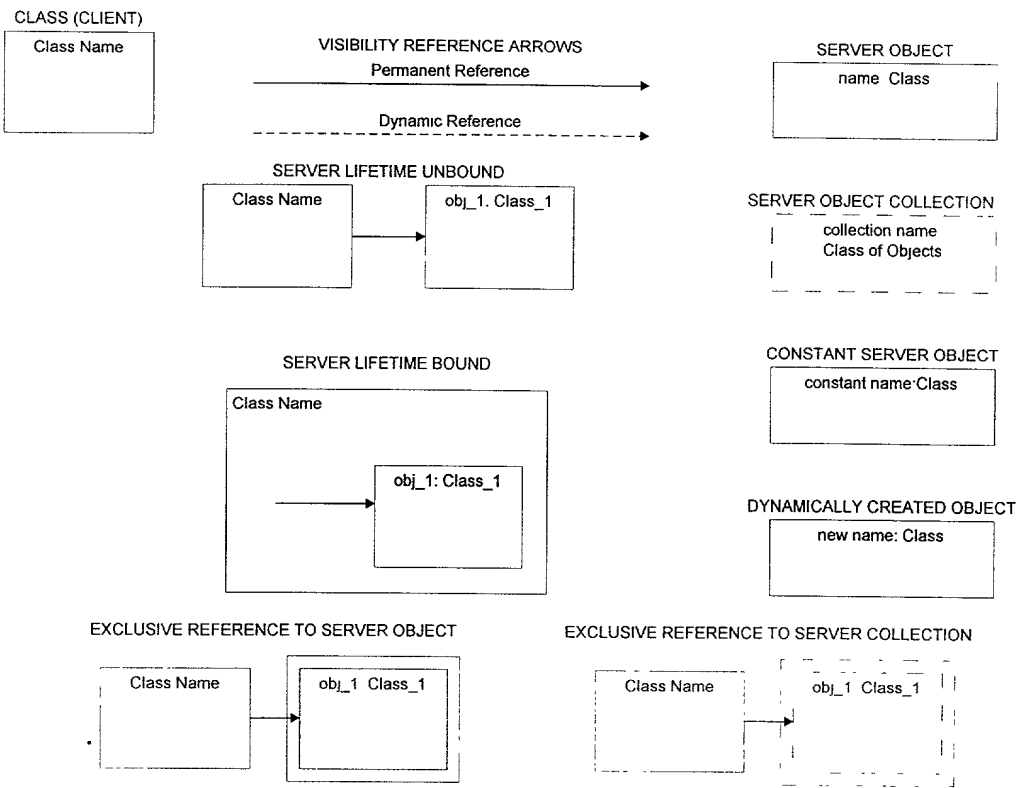


Fig. 59

Class Description Notation:

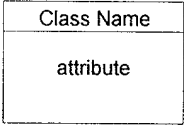
```
class <ClassName> [isa < SuperClassNames>]
  // for each attribute
    [attribute] [mutability]<a_name> :[sharing][Binding]<Type>
    .
    .
    .
  // for each method
    [method] <m_name> <arglist>[:<Type>]
    .
    .
    .
endclass
```

Fig. 60

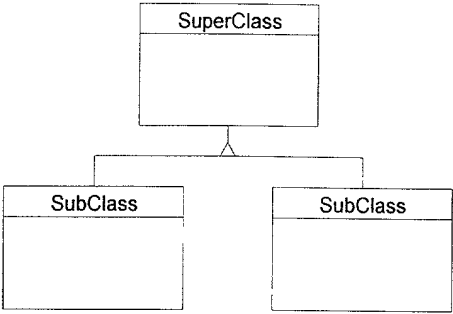
Inheritance Graph Notation

INHERITANCE GRAPH NOTATION

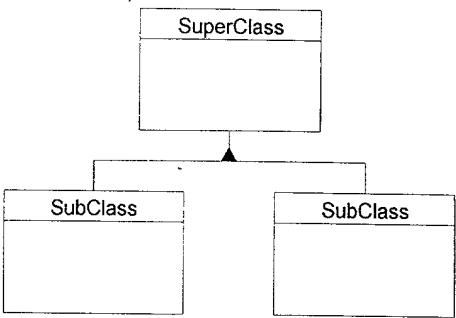
CLASS



INHERITANCE (SUBTYPE INHERITANCE)



Subclasses may overlap (nondisjoint)
Possibly more classes.



Subclasses partition SuperClass

Fig. 61

860227-860228

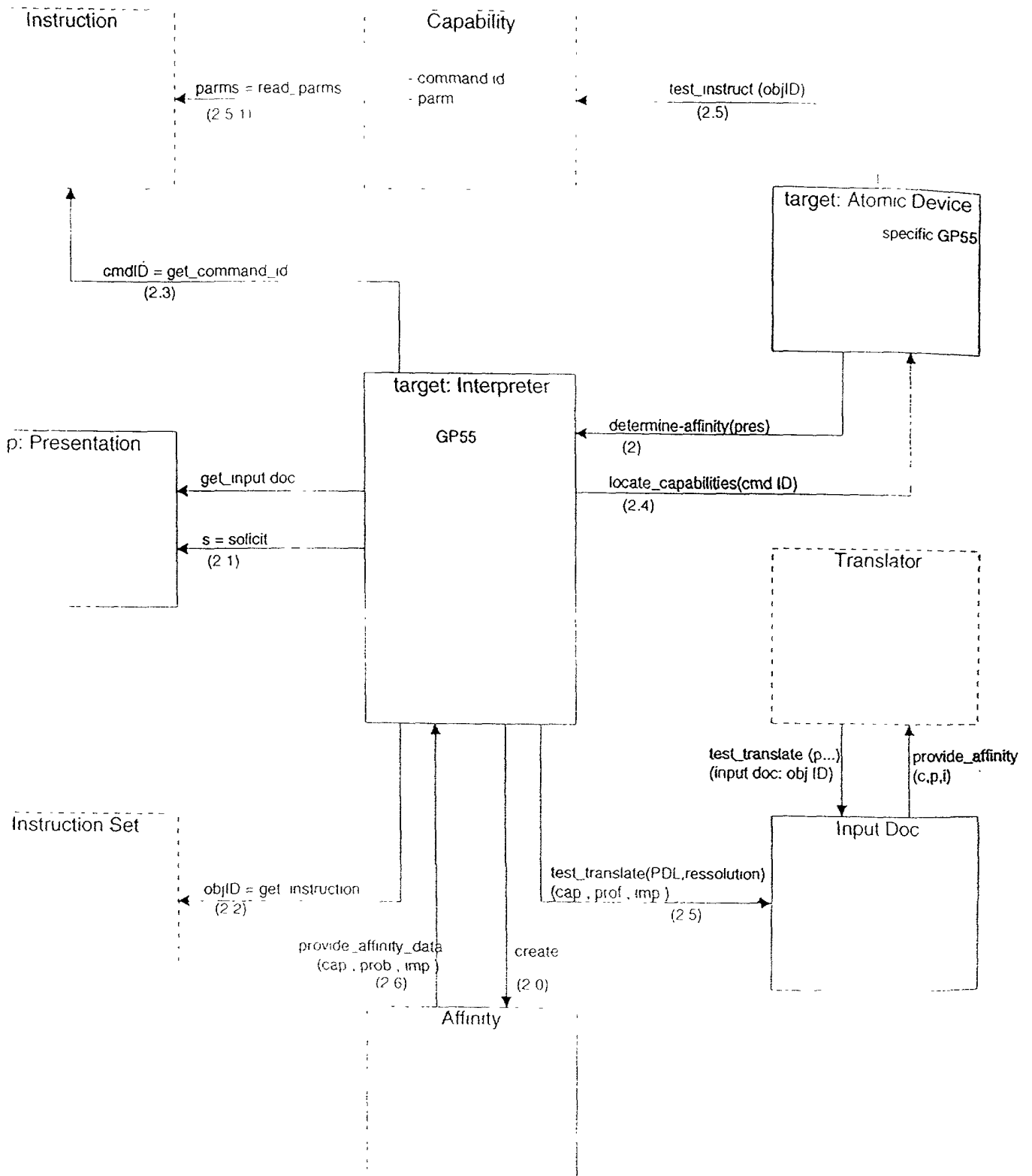


FIG - 62

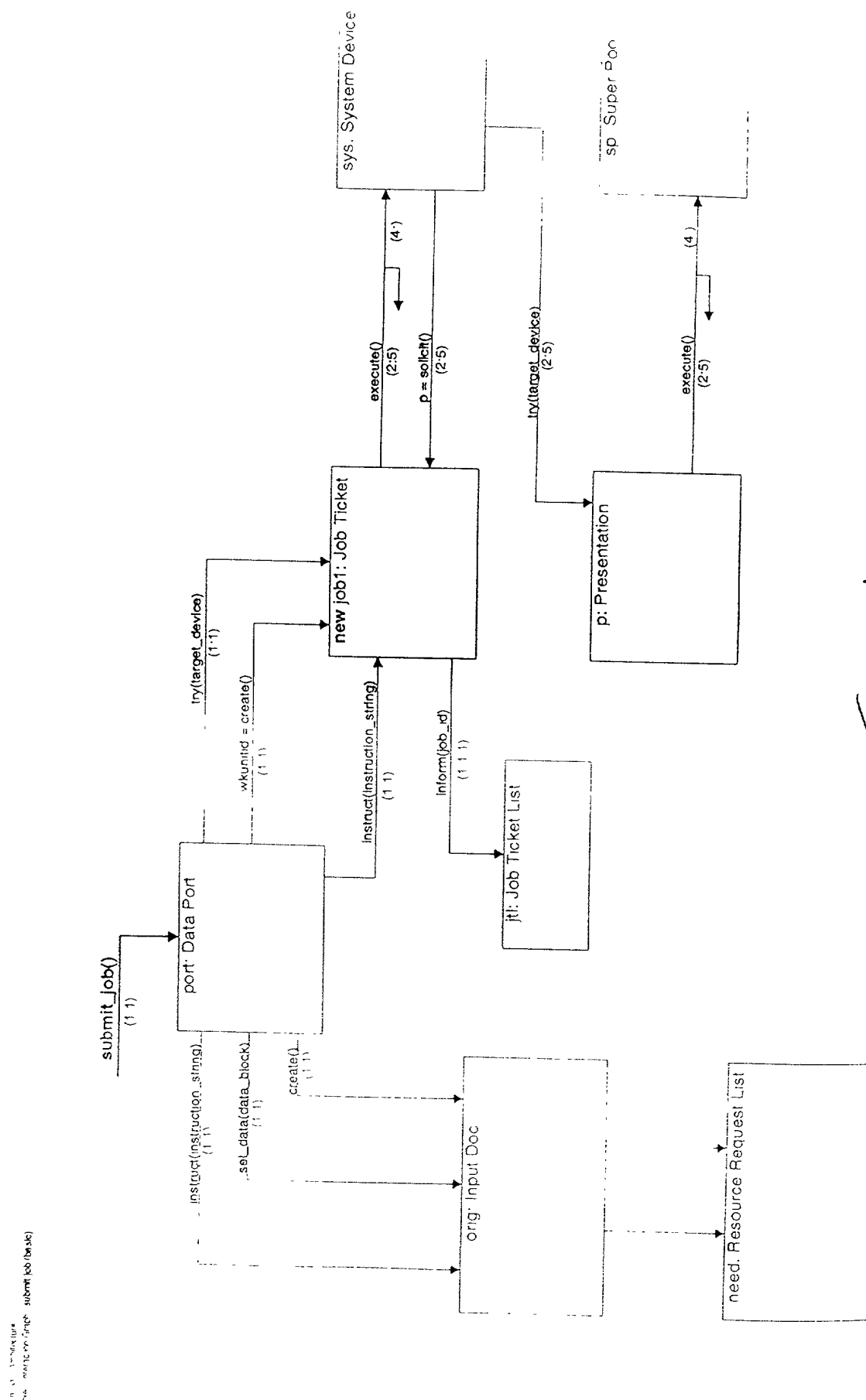
[illegible]

Fig. 63

PrintGate Architecture
 Object: Interaction Graph - Instruct to Job Ticket

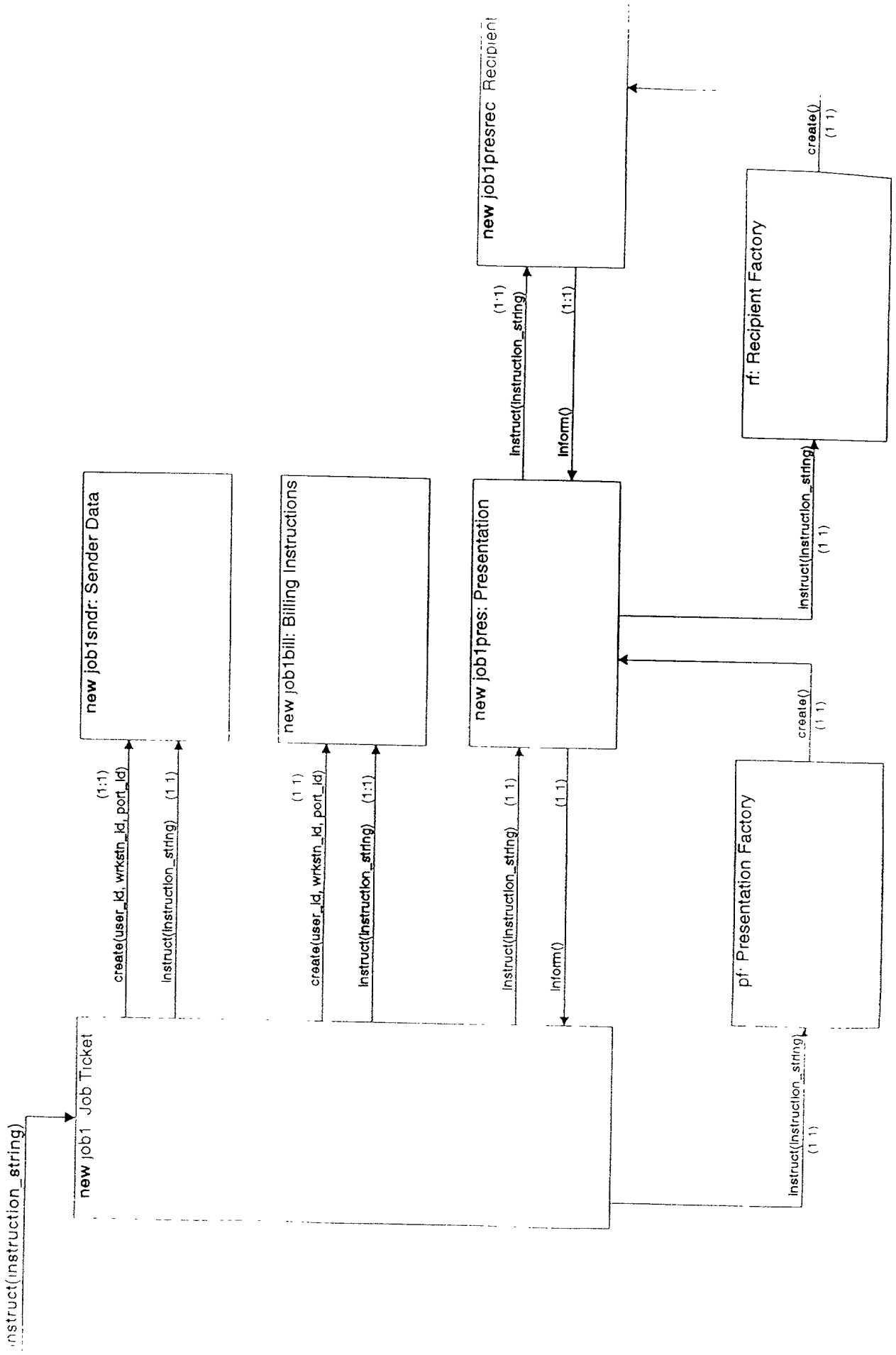


Fig. 64

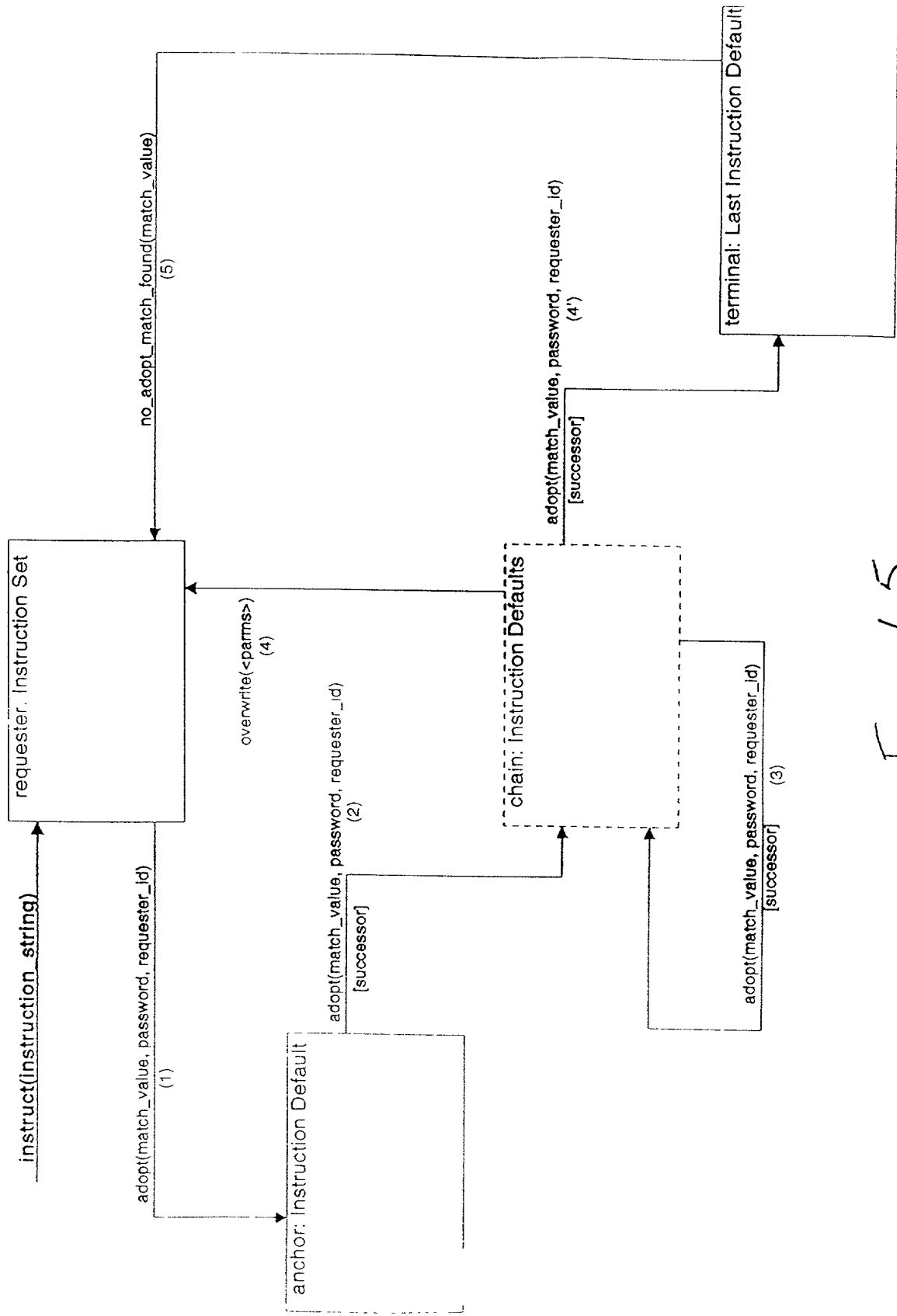


Fig. 65

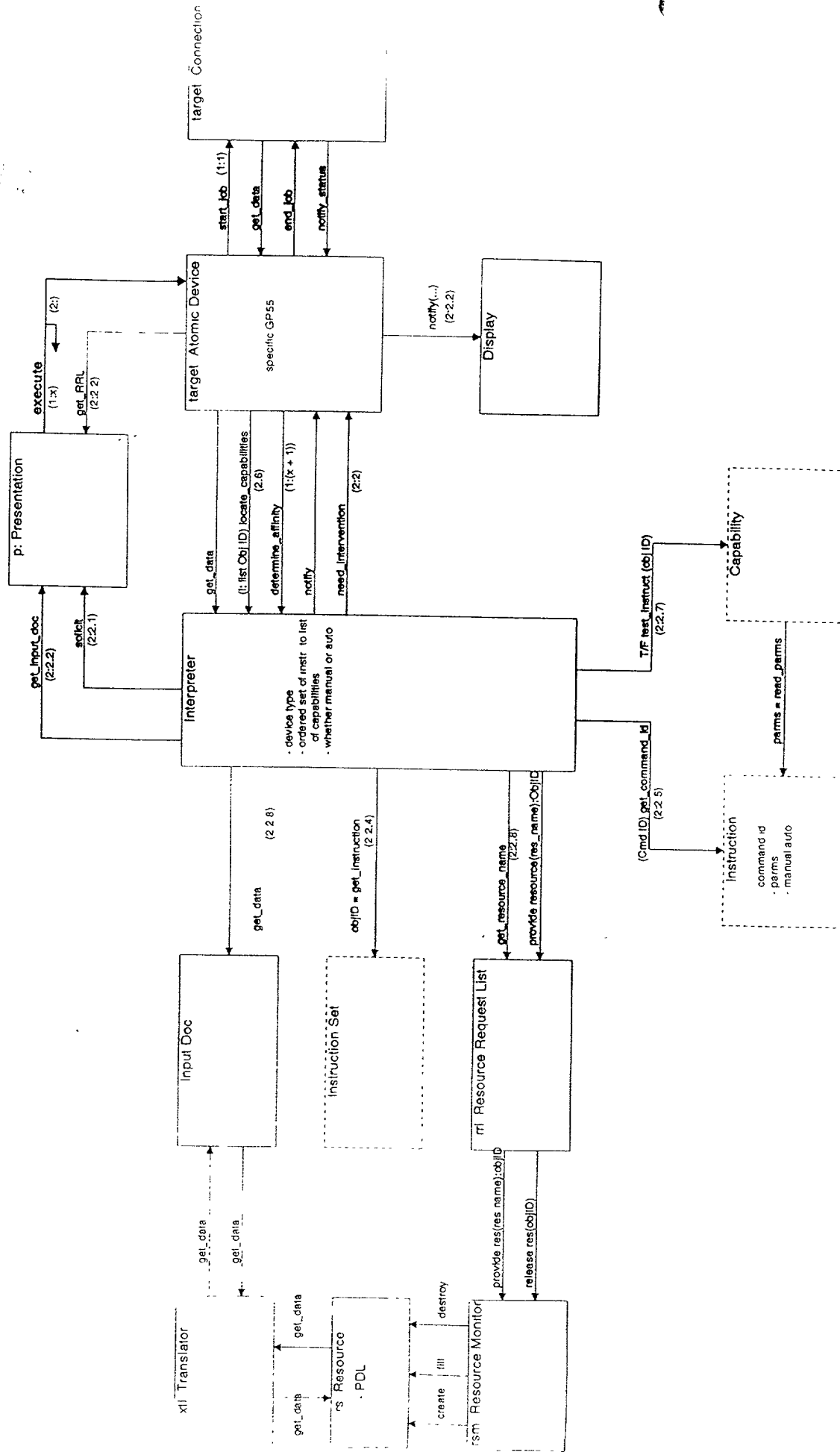


Fig. 666

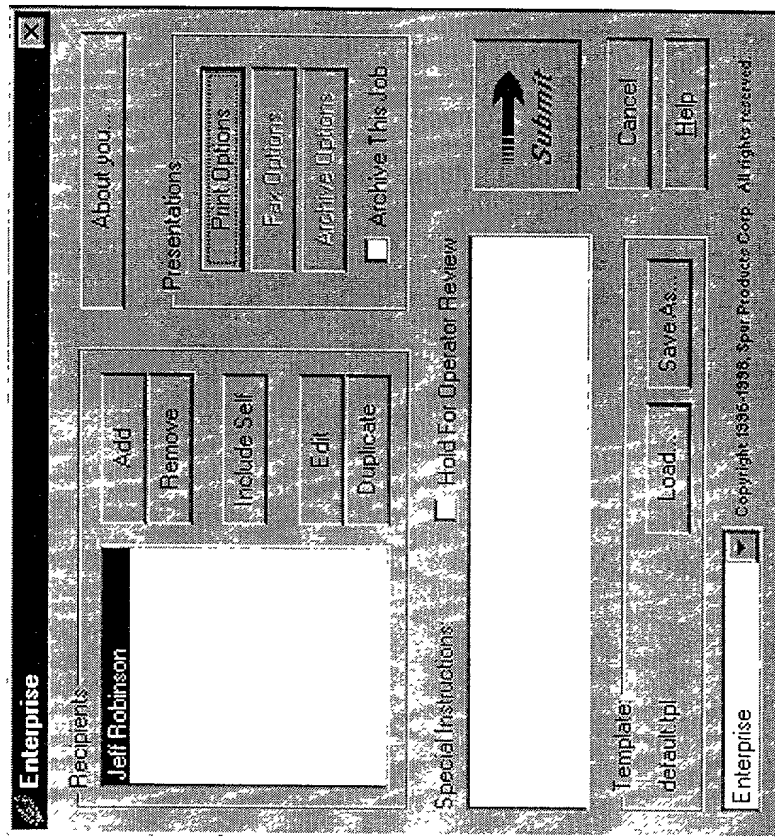


Fig. 67

Recipient Information

Personal Company Shipping

☐ Print to this Recipient ☐ Fax to this Recipient

Name

Division

Mail Stop

E-Mail

Office Phone

Fax Number

Cellular Number

Pager Number

OK Cancel Help

FIG. 68

2025 RELEASE UNDER E.O. 14176

Personal Company Shipping

Name

Address 1

Address 2

City

State / Province

Zip / Postal Code

Country

Phone

Fax Number

OK Cancel Help

FIG. 69

03/17/2005 10:00:00

Recipient Information

Personal Company Shipping

Carrier

- ☒ PickUp
- ☐ Federal Express
- ☐ UPS
- ☐ Mail
- ☐ DHL
- ☐ Airborne Express
- ☐

Priority

- ☒ Priority Overnight
- ☐ Standard Overnight
- ☐ 2nd Day
- ☐ Ground

OK Cancel Help

Fig. 70

2025-06-04 10:00:00

Personal Company Billing

Name

Division

Mail Stop

E-Mail

Office Phone

Fax Number

Cellular Number

Pager Number

OK Cancel Help

Fig. 80
71

2000-0000-0000-0000

About You...

Personal Company Billing

Name:

Address 1:

Address 2:

City:

State/Province:

Zip / Postal Code:

Country:

Phone:

Fax Number:

OK Cancel Help

FIG 80
72

860201" 40651160

The screenshot shows a window titled "About You" with a close button in the top right corner. The "Billing" tab is selected, showing options for payment method. The "Account #:" option is selected with a radio button. To its right is a text input field. Below it are two more radio button options: "PO #:" and "Credit Card:". The "Credit Card:" option is also selected, and to its right is a checkbox that is checked. Below these are four text input fields labeled "Card Number", "Expiration Date", "Authorized Name", and "Maximum Amount to be charged \$:". At the bottom left are two radio button options: "Cash on Delivery" and "Point of Sale". At the bottom right are three buttons: "OK", "Cancel", and "Help".

FIG. 82
73

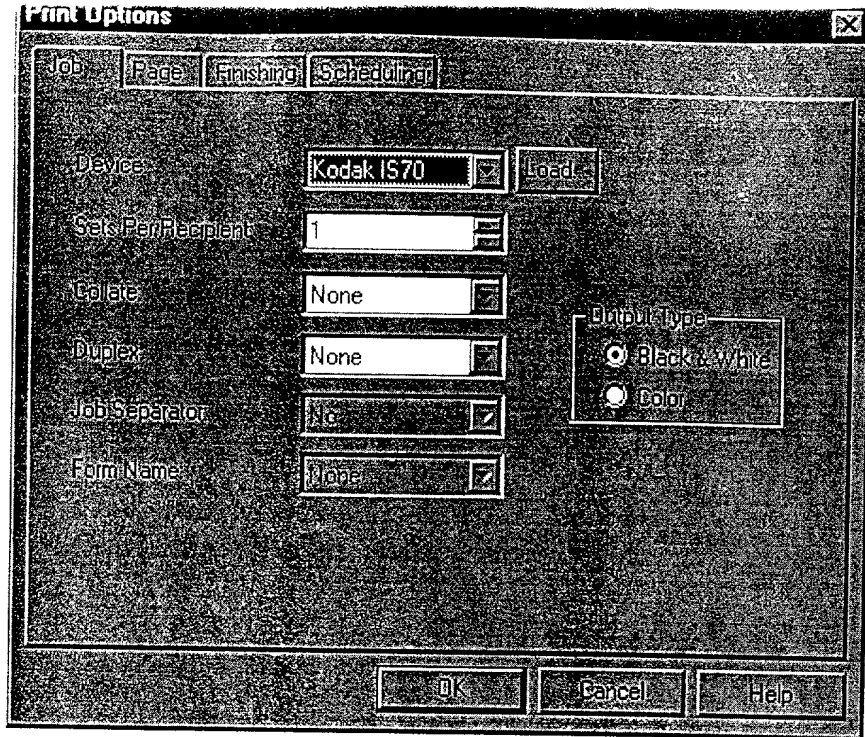


FIG 83
74

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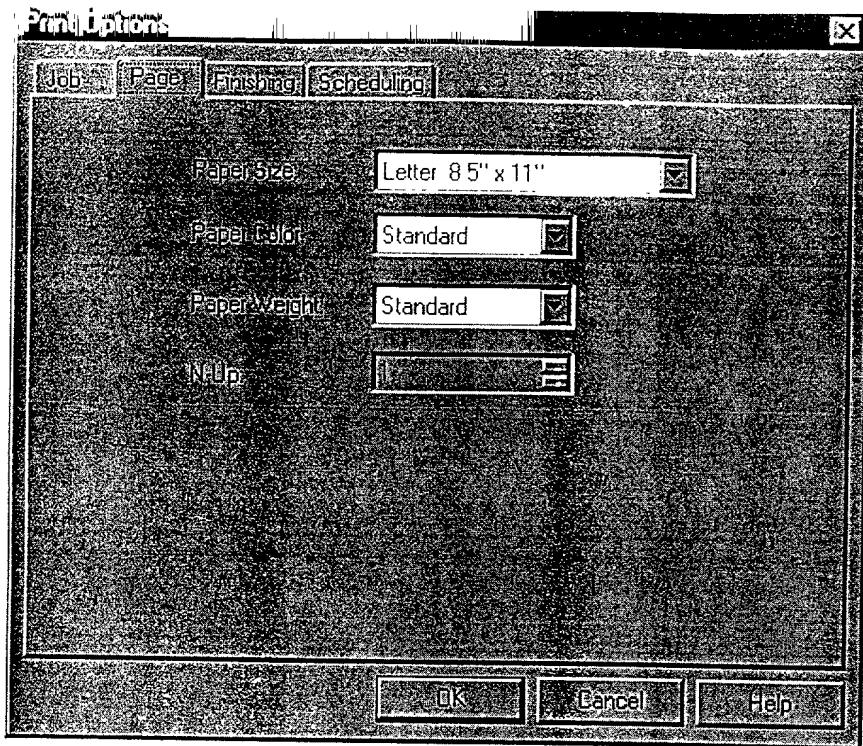


FIG. 84
75

2025 RELEASE UNDER E.O. 14176

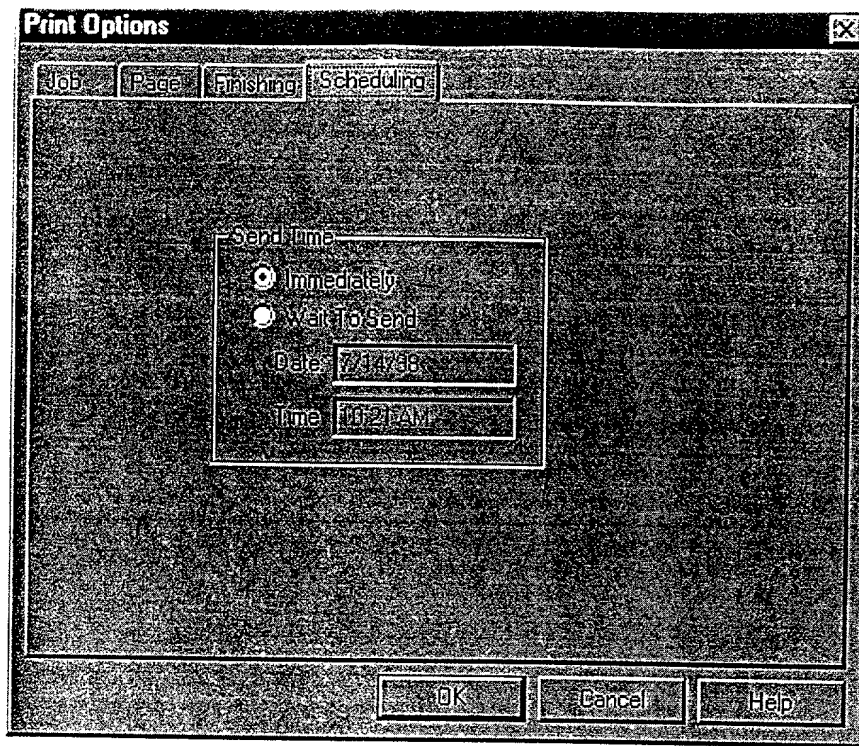


FIG. 86
77

0015009 10098

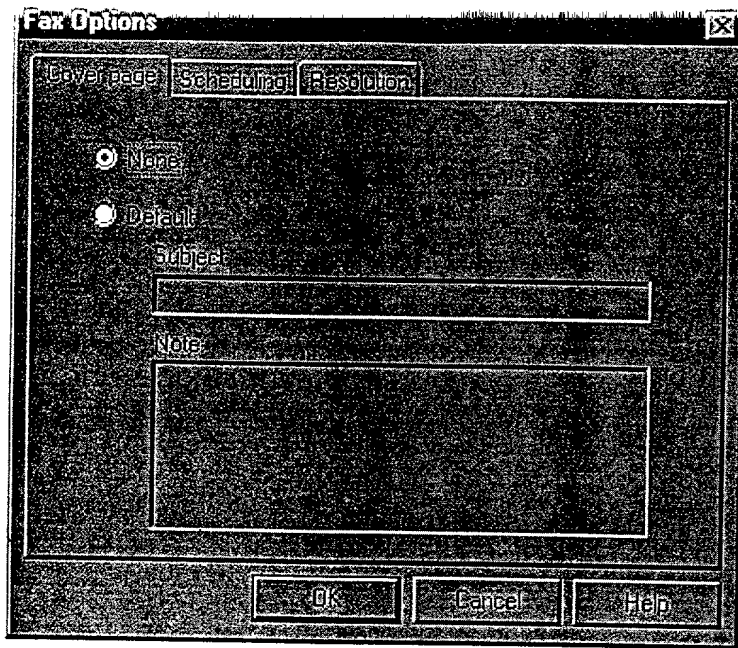


FIG. 87
78

860207 80654600

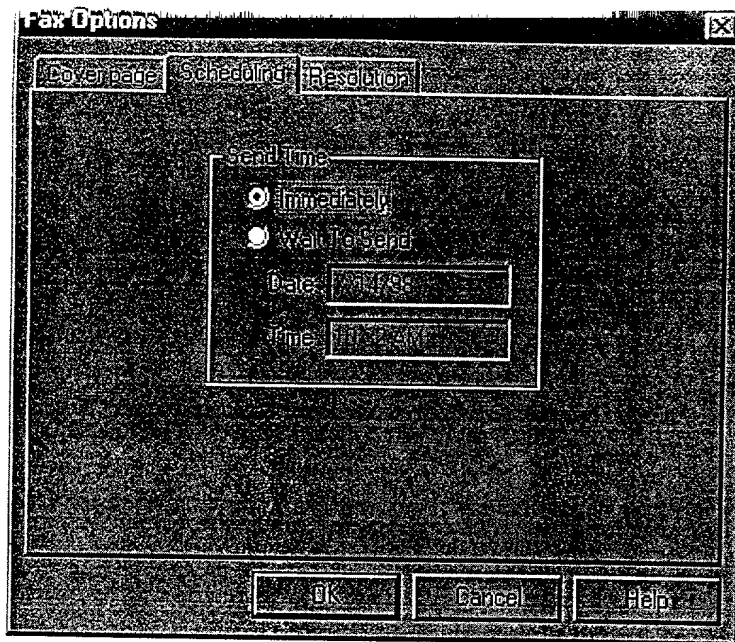


FIG 88
79

2025-06-10 10:00:00

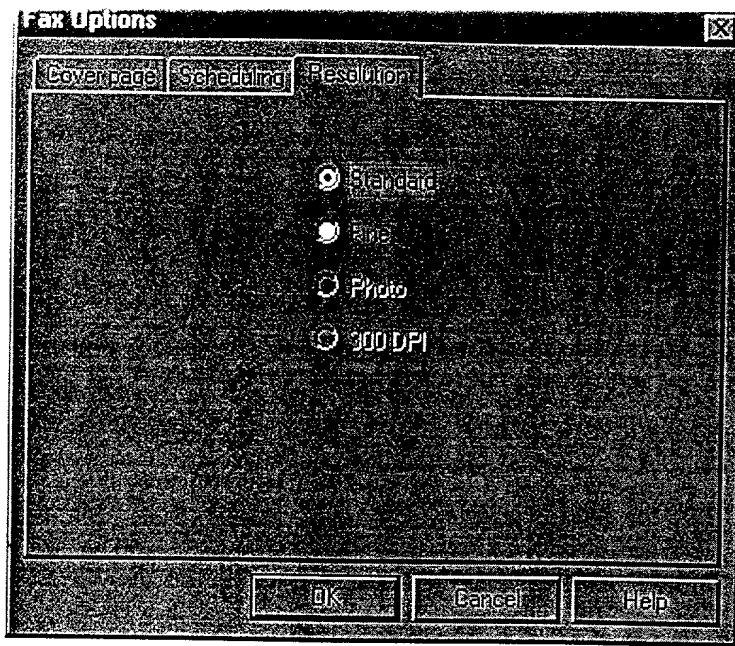


FIG. 80

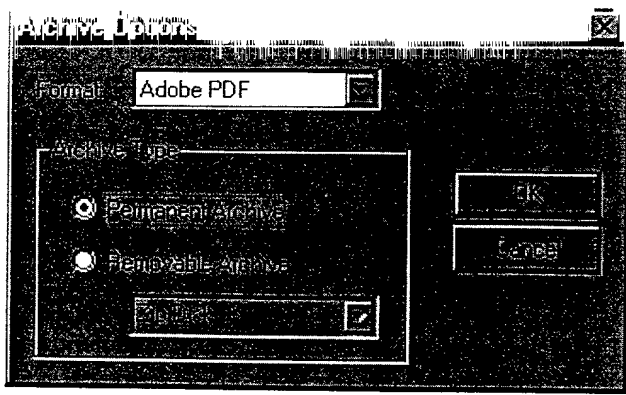


FIG. 90
81

80001-30541-00

Docket No.
SPUR102

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

NETWORK DOCUMENT DELIVERY SYSTEM

the specification of which

(check one)

☒ is attached hereto.

☐ was filed on _____ as United States Application No. or PCT International

Application Number _____

and was amended on _____

(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

60/063,891

10/22/97

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

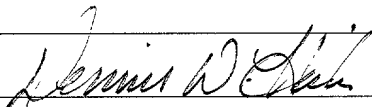
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

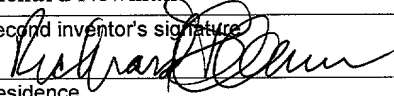
POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(list name and registration number)*

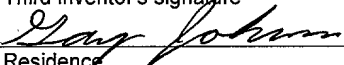
Craig M. Korfanta (Reg. No. 33,255)
 Joseph W. Holland (Reg. No. 38,919)
 Steven R. Ormiston (Reg. No. 35,974)

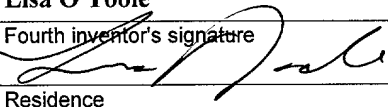
Send Correspondence to: Craig M. Korfanta
 P. O. Box 1840
 Boise, ID 83701-1840

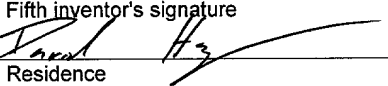
Direct Telephone Calls to: *(name and telephone number)*
 Craig M. Korfanta (208) 336-1234

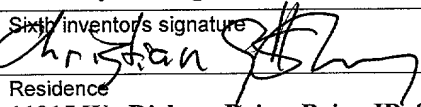
Full name of sole or first inventor	Dennis W. Hicks	
Sole or first inventor's signature		Date 10/2/98
Residence	3018 W. Whitepost Way, Eagle, ID 83616	
Citizenship	US	
Post Office Address	3018 W. Whitepost Way, Eagle, ID 83616	

Full name of second inventor, if any	Richard Newman	
Second inventor's signature		Date 10/1/98
Residence	5201 West Pine Lane, Meridian, ID 83642	
Citizenship	US	
Post Office Address	5201 West Pine Lane, Meridian, ID 83642	

Full name of third inventor, if any Gary Johnson	
Third inventor's signature 	Date 10/1/98
Residence 930 N. Maple Grove, #G204, Boise, ID 83704	
Citizenship US	
Post Office Address 930 N. Maple Grove, #G204, Boise, ID 83704	

Full name of fourth inventor, if any Lisa O'Toole	
Fourth inventor's signature 	Date 10/1/98
Residence 4695 Old Valley Road, Eagle, ID 83616	
Citizenship US	
Post Office Address 4695 Old Valley Road, Eagle, ID 83616	

Full name of fifth inventor, if any David Hay	
Fifth inventor's signature 	Date 10/1/98
Residence 2280 N. Maple Grove, Boise, ID 83704	
Citizenship US	
Post Office Address 2280 N. Maple Grove, Boise, ID 83704	

Full name of sixth inventor, if any Chris Gyllenskog	
Sixth inventor's signature 	Date 10/1/98
Residence 11915 W. Dickens Drive, Boise, ID 83709	
Citizenship US	
Post Office Address 11915 W. Dickens Drive, Boise, ID 83709	

Docket No.
SPUR102

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

NETWORK DOCUMENT DELIVERY SYSTEM

the specification of which

(check one)

☒ is attached hereto.

☐ was filed on _____ as United States Application No. or PCT International

Application Number _____

and was amended on _____

(if applicable)

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Prior Foreign Application(s)			Priority Not Claimed
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

60/063,891

(Application Serial No.)

10/22/97

(Filing Date)

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

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Craig M. Korfanta (Reg. No. 33,255)

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Steven R. Ormiston (Reg. No. 35,974)

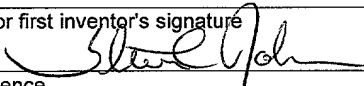
Send Correspondence to: **Craig M. Korfanta**
P. O. Box 1840
Boise, ID 83701-1840

Direct Telephone Calls to: *(name and telephone number)*
Craig M. Korfanta (208) 336-1234

Full name of sole or first inventor

Steven C. Johnson

Sole or first inventor's signature



Date

10/2/98

Residence

2540 N. Constance Place, Eagle, ID 83616

Citizenship

US

Post Office Address

2540 N. Constance Place, Eagle, ID 83616

Full name of second inventor, if any

Second inventor's signature

Date

Residence

Citizenship

Post Office Address

Docket No.
SPUR102

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NETWORK DOCUMENT DELIVERY SYSTEM

the specification of which

(check one)

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Prior Foreign Application(s)

Priority Not Claimed

_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>
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_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>

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60/063,891	10/22/97
_____ (Application Serial No.)	_____ (Filing Date)
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Craig M. Korfanta (Reg. No. 33,2555)

Joseph W. Holland (Reg. No. 38,919)

Steven R. Ormiston (Reg. No. 35,974)

Send Correspondence to: **Craig M. Korfanta**
P. O. Box 1840
Boise, ID 83701-1840

Direct Telephone Calls to: *(name and telephone number)*
Craig M. Korfanta (208) 336-1234

Full name of sole or first inventor Matt Stephenson	
Sole or first inventor's signature <i>Matt SE</i>	Date 10-2-98
Residence C1641 Indy Lane, Stratford, WI 54484	
Citizenship US	
Post Office Address C1641 Indy Lane, Stratford, WI 54484	

Full name of second inventor, if any	
Second inventor's signature	Date
Residence	
Citizenship	
Post Office Address	

Docket No.
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(Status)
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P. O. Box 1840
Boise, ID 83701-1840

Direct Telephone Calls to: *(name and telephone number)*
Craig M. Korfanta (208) 336-1234

Full name of sole or first inventor

Frank Hartmann

Sole or first inventor's signature

Frank G. Hartmann

Date

Oct. 1, 1998

Residence

7061 Valley Heights Drive, Boise, ID 83709

Citizenship

US

Post Office Address

7061 Valley Heights Drive, Boise, ID 83709

Full name of second inventor, if any

Second inventor's signature

Date

Residence

Citizenship

Post Office Address

Docket No.
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Prior Foreign Application(s)

Priority Not Claimed

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60/063,891

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(patented, pending, abandoned)

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(Application Serial No.)

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P. O. Box 1840
Boise, ID 83701-1840

Direct Telephone Calls to: *(name and telephone number)*
Craig M. Korfanta (208) 336-1234

Full name of sole or first inventor Ray Asbury	
Sole or first inventor's signature 	Date 10/2/98
Residence 10684 Albany Court, Boise, ID 83713	
Citizenship US	
Post Office Address 10684 Albany Court, Boise, ID 83713	

Full name of second inventor, if any	
Second inventor's signature	Date
Residence	
Citizenship	
Post Office Address	

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(Country)

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P. O. Box 1840
Boise, ID 83701-1840

Direct Telephone Calls to: *(name and telephone number)*
Craig M. Korfanta (208) 336-1234

Full name of sole or first inventor

Eric Luttmann

Sole or first inventor's signature

Eric J. Luttmann

Date

10/2/98

Residence

5420 S. Cortez Place, Boise, ID 83709

Citizenship

US

Post Office Address

5420 S. Cortez Place, Boise, ID 83709

Full name of second inventor, if any

Second inventor's signature

Date

Residence

Citizenship

Post Office Address

IN THE STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Hicks et al.

Serial No.:

Filed:

For: NETWORK DOCUMENT DELIVERY
SYSTEM

§ Attorney Docket: SPUR102
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EXPRESS MAIL MAILING LABEL

NUMBER: EL 803481995US

DATE OF DEPOSIT: October 20, 1998

I HEREBY CERTIFY THAT THIS PAPER IS BEING DEPOSITED WITH
THE UNITED STATES POSTAL SERVICE EXPRESS MAIL POST
OFFICE TO ADDRESSEE SERVICE UNDER 37 CFR § 1.110 ON THE
DATE INDICATED ABOVE AND IS ADDRESSED TO THE ASSISTANT
COMMISSIONER FOR PATENTS, WASHINGTON, D.C. 20231.

Maggie Hicks
Signature

ELECTION UNDER 37 C.F.R. §§ 3.71 AND 3.73 AND POWER OF ATTORNEY

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir,

The undersigned, being Assignee of the entire interest in the above-identified application by virtue of an Assignment recorded in the United States Patent and Trademark Office as set forth below or filed herewith, hereby elects, under 37 C.F.R. § 3.71, to prosecute the application to the exclusion of the inventor(s).

The Assignee hereby revokes any previous Powers of Attorney and appoints: Craig M. Korfanta, Reg. No. 33,255; Joseph W. Holland, Reg. No. 38,919; and Steven R. Ormiston, Reg. No. 35,974 as its attorney or agent, with full power of substitution and revocation, to prosecute the application, to make alterations and amendments therein, to transact all business in the Patent and Trademark Office in connection therewith, to receive any Letters Patent, and for one year after issuance of such Letters Patent to file any request for a certificate of correction that may be deemed appropriate.

Pursuant to 37 C.F.R. § 3.73, the undersigned duly authorized designee of Assignee certifies that the evidentiary documents have been reviewed, specifically the Assignment to SPUR PRODUCTS referenced below, and certifies that to the best of my knowledge and belief, title remains in the name of the Assignee.

Assignment:

☒ Filed concurrently herewith for recording, a copy of which is attached hereto.

Previously recorded on: _____,
at Reel: _____ Frame: _____.

Please direct all communications as follows:

Craig M. Korfanta
ORMISTON KORFANTA & HOLLAND, PLLC
P.O. Box 1840
Boise, ID 83701-1840

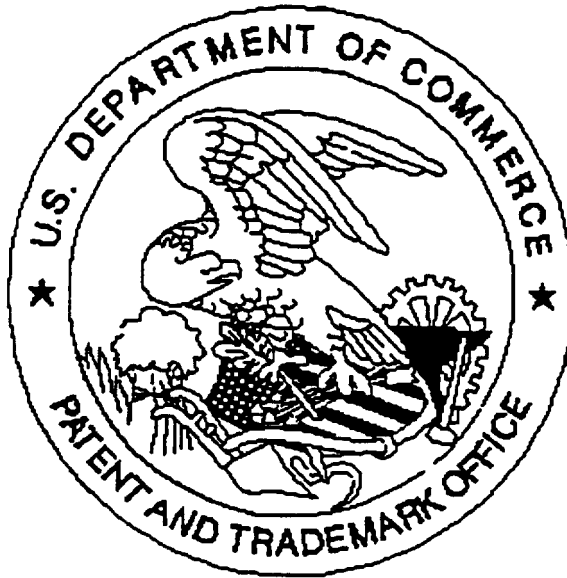
ASSIGNEE: SPUR PRODUCTS

Date: 10/2/98

By:

Dennis W. Hicks
Dennis W. Hicks
President and CEO

United States Patent & Trademark Office
Office of Initial Patent Examination -- Scanning Division



Application deficiencies were found during scanning:

☐ Page(s) Fig. 210 of DRAWINGS were not present
for scanning. (Document title)

☐ Page(s) _____ of _____ were not present
for scanning. (Document title)

☐ Scanned copy is best available.